

# **RADIOCARBON DATES VI**

**Högne Jungner and Eloni Sonninen**

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## **INTRODUCTION**

This report is the sixth date list from the Dating Laboratory at the University of Helsinki. The reports I – V were published in 1979, 1983, 1989, 1996 and 1998. The list includes the samples from laboratory code number Hel-3502 to Hel-4000 dated in 1994-1997. The list also includes the first AMS dates from our laboratory (Hela-1 –). The pretreated and graphitized samples were measured at the AMS facilities in Uppsala. All dates in the list are based on the activity of the new oxalic standard and reported according to the recommendations made by Stuiver and Polach (1977). The dates are corrected for isotope fractionation in the sample.

The list is compiled according to laboratory number. Series of samples from the same site or context are, however, grouped together. At the end of the report an index according to the submitters' institute is included.

## **ACKNOWLEDGEMENTS**

We thank the submitters of the samples for their cooperation and comments, and we are grateful to Anne Forss, Minna Palviainen and Igor Shevchuk for skilful assistance in the laboratory, and Marketta Lehtinen and Christian Carpelan for valuable help in compiling the list.

## IIJÄRVI SERIES, INARI

Coll. and subm. 1993 by M. Kotilainen.

General comment: See Mutusjärvi and Iijärvi Series, Inari, in Jungner and Sonninen (1998).

<b>Hel-3502 Sample 68</b>	<b>850 ± 110</b>
x = 770 285, y = 531 10, z = 230	$\delta^{13}\text{C} = -26.7\%$
Charcoal, depth 0.69 m (the uppermost)	
<b>Hel-3503 Sample 68.</b>	<b>1910 ± 120</b>
Charcoal, depth 0.85 cm (the lowermost)	$\delta^{13}\text{C} = -27.1\%$
<b>Hel-3504 Sample 73</b>	<b>1990 ± 100</b>
x = 769 855, y = 525 15, z = 210	$\delta^{13}\text{C} = -27.0\%$
Charcoal, depth 0.35 m	
<b>Hela-23 Sample 63</b>	<b>3820 ± 70</b>
x = 770 070, y = 523 70, z = 200	$\delta^{13}\text{C} = -26.3\%$
Charcoal, depth 0.30 m	
<b>Hela-24 Sample 68</b>	<b>1740 ± 75</b>
Charcoal, depth 0.76 m	$\delta^{13}\text{C} = -25.6\%$
<b>Hela-25 Sample 69/4</b>	<b>7650 ± 80</b>
x = 770 225, y = 528 60, z = 205	$\delta^{13}\text{C} = -26.5\%$
Charcoal, depth 1.28 m	
<b>Hela-26 Sample 72</b>	<b>4380 ± 100</b>
x = 770 000, y = 526 22, z = 200	$\delta^{13}\text{C} = -24.3\%$
Charcoal, depth 0.72 cm	

## ÅLAND CHURCHES SERIES, ÅLAND

Coll. and subm. 1993 and 1994 by Å. Ringbom.

General comment: See Åland Churches Series, Åland, in Jungner and Sonninen (1998).

Ref. Dreijer (1951, 1954), Ringbom and Remmer (2000).

### Finström Church

<b>Hel-3505 Fika Sample A</b>	<b>710 ± 80</b>
	$\delta^{13}\text{C} = -19.6\%$

Comment (ÅR): West wall, bone, femur(?) slivers from a grave that according to M. Dreijer had been truncated by church foundations. Judging by its position, the bone is the same seen in Dreijer's photos and drawings. The fragmentary state is due to a boulder that was placed as filling after the 1951 dig.

**Hel-3506 Fika Sample B** **540 ± 100**  
**δ<sup>13</sup>C = -18.8‰**

Comment (ÅR): West wall, bone, fragment of humerus shaft that appears to be articulated with its scapula and in normal anatomic position with ribs and probably ulna. It was oriented parallel to the wall, with which it was in contact. The bone is seen in Dreijer's Photo (Dreijer 1951: plåt 1683). It could be from the same period as the truncated skeleton (sample A) or younger than the church wall. Less likely but nevertheless possible is that the samples A and B belong to the same skeleton.

**Hel-3556 Fika 05** **250 ± 80**  
**δ<sup>13</sup>C = -20.7‰**

Comment (ÅR): Wooden sample, log with specially carved ending, lying separate and loose on top of the northern wall of the nave, originally corner construction from timbered building.

**Hel-3557 Fika 08** **470 ± 70**  
**δ<sup>13</sup>C = -23.2‰**

Comment (ÅR): Wooden sample, the eastern rafter truss of the sacristy roof construction. From the south gable of the sacristy, in level with the northern wall of the nave. Visible from the nave, above vault level. Predating the vault of the nave.

**Hel-3558 Fika 09** **470 ± 60**  
**δ<sup>13</sup>C = -22.8‰**

Comment (ÅR): Wooden sample, the right Queens post from the south gable of the sacristy, in level with the northern wall of the nave. Visible from the nave, above vault level, predating the vault of the nave.

**Hel-3559 Fika 13** **470 ± 70**  
**δ<sup>13</sup>C = -25.1‰**

Comment (ÅR): Wooden sample, piece of wood walled in the northern wall of the nave, or in the south gable of the sacristy. Sample taken from the attic of the sacristy, close to the walled in opening to the nave.

**Hel-3560 Fika 24** **480 ± 70**  
**δ<sup>13</sup>C = -22.7‰**

Comment (ÅR): Wooden sample, end of tassel, marked IIII, by the fourth roof truss from the west, along the south wall of the nave.

## Saltvik Church

**Hel-3507 Saka Sample C** **520 ± 80**  
**δ<sup>13</sup>C = -20.1‰**

Comment (ÅR): Bone from skeleton by the northern wall of the nave. Right clavicle from articulated skeleton, not identical to the bisected skeleton observed by M. Dreijer in 1954, probably below it.

**Hel-3508 Saka Sample D** **630 ± 70**  
**δ<sup>13</sup>C = -19.4‰**

Comment (ÅR): Bone from skeleton by the northern wall of the nave. Right tibia from articulated skeleton, not identical to the bisected skeleton observed by Mr. Dreijer in 1954, probably below it.

**Hel-3561 Saka 107** **520 ± 70**  
**δ<sup>13</sup>C = -22.7‰**

Comment (ÅR): Wooden sample from the attic of the nave, the northern wall, fragment of wooden scaffolding, low down against the northeast spandrel of the northern nave.

**Hel-3562 Saka 108** **640 ± 70**  
**δ<sup>13</sup>C = -22.7‰**

Comment (ÅR): Wooden sample, from the attic of the nave, the northern wall. Fragment of wooden scaffolding, down against the spandrel between the first and second bay.

**Hel-3563 Saka 111** **530 ± 70**  
**δ<sup>13</sup>C = -23.3‰**

Comment (ÅR): Wooden sample from a cut tie beam in the west gable, on the south side. Sample partly burnt into charcoal. Should predate the tower, since it stretches behind the tower wall.

**Hel-3564 Saka 112** **480 ± 75**  
**δ<sup>13</sup>C = -22.8‰**

Comment (ÅR): Wooden sample from the exterior of the west gable of the nave. Fragment of wooden scaffolding, ca 20 cm below and 90 cm south of the opening to the attic of the nave.

**Hel-3565 Saka 115** **510 ± 70**  
**δ<sup>13</sup>C = -21.7‰**

Comment (ÅR): Wooden sample from the tower, wooden scaffolding still in situ in the south wall of the tower chamber. Ca 30 cm below horizontal level.

## STRÅKA SERIES, PÅRAS, KRONOBY

63°43'N, 23°03'E; 10 m a.s.l.  
Coll. and subm. 1993 and 1996 by H. Vikström.

**Hel-3509 Sample 1** **modern**  
Wood, depth 0.80-0.90 m **δ<sup>13</sup>C = -24.1‰**

**Hel-3510 Sample 2** **150 ± 90**  
Wood, depth 0.30 m **δ<sup>13</sup>C = -25.3‰**

**Hel-3914 Stråka 1** **300 ± 80**  
Charcoal **δ<sup>13</sup>C = -26.5‰**

**Hel-3915 Stråka 2**  
Charcoal

$70 \pm 100$   
 $\delta^{13}\text{C} = -25.5\%$

**Hel-3511 KÄTKIKIELAS S3, UTSJOKI**

$1750 \pm 90$   
 $\delta^{13}\text{C} = -30.0\%$

420 m a.s.l.

Coll. and subm. 1993 by J. Hietaranta.

Charcoal from a sand layer, depth 1.00 m

**SKAIDEJAVRI SERIES, UTSJOKI**

70°03'N, 27°52'E; 182 m a.s.l.

Coll. 1992 and subm. 1993 by H. Seppä.

Ref. Seppä (1996).

**Hel-3512 Lake Skaidejavri 980-970**  
Gyttja, depth 9.75 m

$9660 \pm 180$   
 $\delta^{13}\text{C} = -23.1\%$

**Hel-3513 Lake Skaidejavri 955-945**  
Gyttja, depth 9.50 m

$7830 \pm 140$   
 $\delta^{13}\text{C} = -27.9\%$

**Hel-3514 Lake Skaidejavri 798-788**  
Gyttja, depth 7.93 m

$3280 \pm 120$   
 $\delta^{13}\text{C} = -28.5\%$

**Hel-3515 Lake Skaidejavri 715-705**  
Gyttja, depth 7.10 m

$2220 \pm 110$   
 $\delta^{13}\text{C} = -29.8\%$

**Hel-3516 Lake Skaidejavri 662-652**  
Gyttja, depth 6.57 m

$1380 \pm 110$   
 $\delta^{13}\text{C} = -30.2\%$

**RAUTUSELKÄ SERIES, INARI**

69°34'N, 28°32'E; 136 m a.s.l.

Coll. 1992 and subm. 1993 by H. Seppä.

Ref. Seppä (1996).

**Hel-3517 Lake Rautuselkä 585-575**  
Gyttja, depth 5.80 m

$9990 \pm 140$   
 $\delta^{13}\text{C} = -23.5\%$

**Hel-3518 Lake Rautuselkä 535-525**  
Gyttja, depth 5.30 m

$7300 \pm 120$   
 $\delta^{13}\text{C} = -26.4\%$

**Hel-3519 Lake Rautuselkä 510-500**  
Gyttja, depth 5.05 m

$6010 \pm 120$   
 $\delta^{13}\text{C} = -25.8\%$

**Hel-3520 Lake Rautuselkä 404-395**  
Gyttja, depth 4.00 m

$2030 \pm 100$   
 $\delta^{13}\text{C} = -24.7\%$

**STRYKMOSSEN SERIES, KIRKNIEMI**

60°09'N, 23°57'E; 50 m a.s.l.  
Coll. and subm. 1993 by A. Korhola.

<b>Hel-3521</b>	<b>STRYK 500-510</b>	<b>6120 ± 100</b>
	Peat, depth 5.00-5.10 m	$\delta^{13}\text{C} = -29.6\%$
<b>Hel-3522</b>	<b>STRYK 510-520</b>	<b>6170 ± 100</b>
	Peat, depth 5.10-5.20 m	$\delta^{13}\text{C} = -31.2\%$

**LAMANSMOSEN SERIES, KARJAA**

60°01'N, 23°35'E; 20 m a.s.l.  
Coll. and subm. 1993 by A. Korhola.  
Ref. Korhola (1996).

<b>Hel-3523</b>	<b>LA 1</b>	<b>2600 ± 120</b>
	Peat, depth 0.70-0.78 m	$\delta^{13}\text{C} = -28.2\%$
<b>Hel-3524</b>	<b>LA 2</b>	<b>3090 ± 100</b>
	Peat, depth 1.96-2.05 m	$\delta^{13}\text{C} = -28.0\%$
<b>Hel-3525</b>	<b>LA 3</b>	<b>3120 ± 100</b>
	Peat, depth 1.37-1.45 m	$\delta^{13}\text{C} = -27.6\%$
<b>Hel-3526</b>	<b>LA 4</b>	<b>3710 ± 110</b>
	Peat, depth 2.40-2.48 m	$\delta^{13}\text{C} = -28.2\%$
<b>Hel-3527</b>	<b>LA 5</b>	<b>4220 ± 110</b>
	Peat, depth 2.70-2.77 m	$\delta^{13}\text{C} = -28.8\%$
<b>Hel-3528</b>	<b>LA 6</b>	<b>3550 ± 100</b>
	Peat, depth 2.47-2.55 m	$\delta^{13}\text{C} = -27.8\%$
<b>Hel-3529</b>	<b>LA 7</b>	<b>3890 ± 110</b>
	Peat, depth 2.68-2.76 m	$\delta^{13}\text{C} = -27.7\%$
<b>Hel-3530</b>	<b>LA 8</b>	<b>3080 ± 100</b>
	Peat, depth 1.00-1.08 m	$\delta^{13}\text{C} = -28.4\%$
<b>Hel-3531</b>	<b>LB 1</b>	<b>2790 ± 90</b>
	Peat, depth 1.60-1.67 m	$\delta^{13}\text{C} = -27.4\%$
<b>Hel-3532</b>	<b>LB 2</b>	<b>4070 ± 110</b>
	Peat, depth 1.68-1.76 m	$\delta^{13}\text{C} = -28.8\%$
<b>Hel-3533</b>	<b>LB 3</b>	<b>4180 ± 110</b>
	Peat, depth 1.77-1.85 m	$\delta^{13}\text{C} = -28.7\%$

<b>Hel-3534 LB 4</b>	<b>3680 ± 100</b>
Peat, depth 1.25-1.35 m	$\delta^{13}\text{C} = -28.6\%$
<b>Hel-3535 LC 1</b>	<b>2210 ± 100</b>
Peat, depth 1.10-1.18 m	$\delta^{13}\text{C} = -28.0\%$
<b>Hel-3536 LC 2</b>	<b>2040 ± 100</b>
Peat, depth 1.70-1.78 m	$\delta^{13}\text{C} = -27.0\%$
<b>Hel-3537 LC 3</b>	<b>3140 ± 100</b>
Peat, depth 2.50-2.59 m	$\delta^{13}\text{C} = -28.2\%$
<b>Hel-3538 LC 4</b>	<b>5590 ± 110</b>
Peat, depth 1.64-1.72 m	$\delta^{13}\text{C} = -29.3\%$

### HOPSEIDET SERIES, NORWAY

70°50'N, 27°43'E; 225 m a.s.l.  
 Coll. 1993 and subm. 1994 and 1995 by H. Seppä.  
 Ref. Seppä (1996).

<b>Hel-3539 Lake Hopseidet 785</b>	<b>4400 ± 110</b>
Gyttja, depth 7.85 m	$\delta^{13}\text{C} = -26.2\%$
<b>Hel-3540 Lake Hopseidet 835</b>	<b>6510 ± 100</b>
Gyttja, depth 8.35 m	$\delta^{13}\text{C} = -25.0\%$
<b>Hel-3541 Lake Hopseidet 900</b>	<b>9290 ± 140</b>
Gyttja, depth 9.00 m	$\delta^{13}\text{C} = -24.8\%$
<b>Hel-3542 Lake Hopseidet 916</b>	<b>10570 ± 110</b>
Gyttja, depth 9.16 m	$\delta^{13}\text{C} = -24.0\%$
<b>Hel-3644 Lake Hopseidet 746</b>	<b>2470 ± 100</b>
Gyttja, depth 7.46 m	$\delta^{13}\text{C} = -27.9\%$

### Hel-3543 HANGASKANGAS, PIKKARALA

**4130 ± 90**  
 $\delta^{13}\text{C} = +0.1\%$

Coll. 1993 and subm. 1994 by S. Roman.  
 Shells of *Mytilus Edulis*  
 Ref. Eronen et al. (1995).



**Hel-3544 KOTAMAA, SODANKYLÄ 62****3880 ± 100**  
**δ<sup>13</sup>C = -25.7‰**

67°29'N, 26°39'E; 181 m a.s.l.

Coll. 1993 by T. Ylimaunu and subm. 1993 by M. Sarkkinen.

KM 27957:272, charcoal, depth 0.15-0.20 m

Comment (MS): Kotamaa is a Stone Age riverside dwelling place without accurate datable archaeological material (findings containing quartz and burnt bone). The sample was collected from a refuse pit (Pit No. 2) together with small quartz flakes and burnt bone (elk, bird, beaver? and deer?). The radiocarbon date is well acceptable and it dates the site to the end of the Stone Age.

Ref. In Edgren et al., eds. (1996).

**POIKAMELLA SERIES, SODANKYLÄ 63**

67°27'N, 26°36'E; 177-180 m a.s.l.

General comment (MS): Poikamella is a riverside dwelling place which on the basis of the archaeological material seems to have had dwellers from the Mesolithic to the Early Metal Age. The main phase is the Epineolithic/Early Metal Age. Excavation in 1993 by M. Sarkkinen and in 1994 by E. Raike.

Ref. In Edgren et al., eds. (1996).

**Hel-3545 KM 27958:21****6300 ± 100**

Coll. and subm. 1993 by M. Sarkkinen.

**δ<sup>13</sup>C = -26.1‰**

Charcoal, depth 0.55 m

Comment (MS): The sample is collected from dirty soil together with quartz scraper and flake when defining the limits of the site. The radiocarbon date suggests an earlier phase at the site.

**Hel-3667 Sample 1/B****2650 ± 100**

Coll. 1994 and subm. 1995 by E. Raike.

**δ<sup>13</sup>C = -24.7‰**

Charcoal, depth 0.15 m

**Hel-3668 Sample 2/C****5790 ± 110**

Coll. 1994 and subm 1995 by E. Raike.

**δ<sup>13</sup>C = -26.6‰**

Charcoal, depth 0.20 m

**Hela-28 KM 28520:345****2990 ± 60**

Coll. 1994 and subm. 1995 by E. Raike

**δ<sup>13</sup>C = -26.3‰**

Charred crust from ceramics, depth 0.15 m

**AURALA SERIES, PUDASJÄRVI**

65°23'N, 26°51'E; 110-115 m a.s.l.

Coll. 1993 by M. Mäki vuoti and subm. 1993 by M. Torvinen.

General comment (MT): The finds of the site range from the Mesolithic Stone Age to the Late Iron Age. The oldest date is in accordance with the finds. The younger date as "too young" is in conflict with the archaeological finds.

Ref. In Edgren et al., eds. (1996).

**Hel-3546 KM 27936:44**

Charcoal sample taken from pit house II.  
depth 0.50 m

**840 ± 90**  
 **$\delta^{13}\text{C} = -25.4\%$**

**Hel-3547 KM 27936:42**

Charcoa sample taken from pit house I.  
depth 1.20 m

**3880 ± 100**  
 **$\delta^{13}\text{C} = -25.0\%$**

**PAIKKALA SERIES, HÄMEENLINNA**

60°31'N, 24°58'E; 85-90 m a.s.l.  
Coll. and subm. 1993 by H. Asplund.  
Ref. In Edgren et al., eds. (1996).

**Hel-3548 KM 27786:14 A**

Charcoal, depth 0.45 m

**230 ± 90**  
 **$\delta^{13}\text{C} = -23.9\%$**

**Hel-3549 KM 27786:14 B**

Charcoal, depth 1.05 m

**450 ± 80**  
 **$\delta^{13}\text{C} = -25.6\%$**

**Hel-3550 KM 27786:14 C**

Charcoal, depth 0.45-0.55 m

**1630 ± 90**  
 **$\delta^{13}\text{C} = -24.6\%$**

**RYÖKÄS SERIES, RÄHÄLÄ, LIETO**

60°32'N, 22°27'E; 25 m a.s.l.  
Coll. and subm. 1993 by E. Raike.  
Ref. In Edgren et al., eds. (1996).

**Hel-3551 Structure 5**

Charcoal, depth 0.50 m

**910 ± 110**  
 **$\delta^{13}\text{C} = -25.7\%$**

**Hel-3552 Structure 19 A, sector A**

Charcoal, depth 0.50 m

**830 ± 90**  
 **$\delta^{13}\text{C} = -25.5\%$**

**Hel-3553 VANNIPUULA**

**8730 ± 100**  
 **$\delta^{13}\text{C} = -27.6\%$**

61°34'N, 26° 02'E; 94 m a.s.l.  
Coll. 1993 and subm. 1994 by M. Tikkanen.  
Peat, depth 0.87-0.90 m  
Comment (MT): The sample was collected from a core obtained from a peat layer submerged beneath the waters of the Vannipuula transgression. Mire formation began here by paludification of the mineral soil.  
Ref. Tikkanen (1995).

**SIRKKAJÄRVI SERIES, SIRKKAJÄRVI**

60°51'N, 25°25'E; 132 m a.s.l.

Coll. 1991 by A. Korhola and M. Tikkanen, subm. 1994 by M. Tikkanen.

General comment (MT): The bulk samples were taken from the lowermost section of the sediment at the deepest point of the lake. The dates are in good agreement with the pollen stratigraphy, but younger than expected.

Ref. Korhola and Tikkanen (1996).

**Hel-3554 Sirkkajärvi 1** **8670 ± 140**  
Gyttja, depth 8.43-8.53 m **δ<sup>13</sup>C = -27.9‰**

**Hel-3555 Sirkkajärvi 2** **8230 ± 120**  
Gyttja, depth 8.23-8.33 m **δ<sup>13</sup>C = -29.1‰**

**Hel-3556 – Hel-3560** See ÅLAND CHURCHES SERIES (Finström) Hel-3505

**Hel-3561 – Hel-3565** See ÅLAND CHURCHES SERIES (Saltvik) Hel-3505

**SAAMENMUSEO SERIES, INARI 13**

68°54'N, 27°01'E

Coll. 1993 and 1994 and subm. 1994 by S-L. Seppälä.

General comment: See Hel-2635 in Jungner and Sonninen (1996), Hel-2911 and Saamen museo 13 Series in Jungner and Sonninen (1998); see also Arponen and Hintikainen (1995).

Ref. In Edgren et al., eds. (1996).

**Hel-3566 Sample 1/1993 380/390 B** **2610 ± 100**  
127.65 m a.s.l. **δ<sup>13</sup>C = -26.3‰**  
Charcoal, depth 0.80 m

**Hel-3567 Sample 2/1993 382/390 B** **2610 ± 80**  
127.28 m a.s.l. **δ<sup>13</sup>C = -26.4‰**  
Charcoal, depth 0.40 m

**Hel-3568 Sample 3/1993 302/416 C** **7330 ± 120**  
124.58 m a.s.l. **δ<sup>13</sup>C = -25.9‰**  
Charcoal

**Hel-3580 Pit, stone setting** **7600 ± 90**  
122.85 m a.s.l. **δ<sup>13</sup>C = -25.5‰**  
Charcoal, depth 0.45 m

**VUOPAJA SERIES, INARI 14**

68°54'N, 27°01'E

Coll. 1993 and subm. 1994 by S-L. Seppälä.

Ref. Arponen and Hintikainen (1995), In: Edgren et al., eds. (1996).

**Hel-3569 Sample 4/1993 574/997**

123.20 m a.s.l.

Charcoal, depth 0.35 m

**6850 ± 110****δ<sup>13</sup>C = -27.3‰****Hel-3570 Sample 5/1993 582/994-995**

123.82 m a.s.l.

Charcoal, depth 0.30 m

**7530 ± 150****δ<sup>13</sup>C = -27.1‰****Hel-3571 Sample 6/1993 626/1004**

128.65 m a.s.l.

Charcoal, depth 0.35 m

**6890 ± 110****δ<sup>13</sup>C = -26.2‰****Hel-3572 TIKANTONTTI, HULKKIO, KAARINA****1820 ± 100****δ<sup>13</sup>C = -23.8‰**

60°25'N, 22°25'E; 24 m a.s.l.

Coll. and subm. 1993 by N. Strandberg.

Sample 576/312, charcoal, depth 0.38 m

Ref. In Edgren et al., eds. (1995, 1996).

**HAASIINNIEMI SERIES, LIEKSA 25**

63°07'N, 30°20'E; 100 m a.s.l.

Coll. and subm. 1993 by K. Katiskoski.

General comment (KK): These samples belong to a series of five samples taken from an excavation at the multi-period dwelling site of Haasiinniemi on the south-eastern shore of lake Pielinen. The previously dated samples represent a cultural horizon of an early stage of occupation (Mesolithic) approx. 101 m a.s.l. and some 7 m above the present water level of the lake (Hel-3308: 7390 ± 120 BP). The horizon was covered with a thick layer of sand (½ m) apparently caused by a transgressive water level, probably connected with the maximum of Pielinen and the outburst of the Uimaharju threshold. However, this dating is some 1000 years younger than expected. Another sample (Hel-3307: 6060 ± 120 BP) collected from a horizon at the bottom (ca. 99.5 m a.s.l.) of the terrace referred above with a disturbed hearth and an Early Combed Ceramic vessel (Ka 1:1) is in accordance with the archaeological dating of this context. The third sample dated previously (Hel-3309: 1630 ± 110 BP) derives from a hearth located on the lowermost bank (ca. 96 m a.s.l.) of Pielinen (94 m a.s.l.). Of the two samples at hand the older one was taken from a hearth as well (Hel-3574: 5420 ± 110 BP) at an altitude of ca. 99 m a.s.l. It refers to an early stage of typical Comb Ware with no direct archaeological evidence from that period. The other sample is from one of the pitfalls (No. 4) of the site complex (Hel-3573: 2520 ± 100 BP).

Ref. In Edgren et al., eds. (1996).

**Hel-3573 Sample 1** 2520 ± 100  
Charcoal, depth 0.35 m  $\delta^{13}\text{C} = -26.1\%$

**Hel-3574 Sample 4** 5240 ± 110  
Charcoal, depth 0.50 m  $\delta^{13}\text{C} = -25.4\%$

### KYYHKYLÄ SERIES, PORRASSALMI, MIKKELI

61°38'N, 27°17'E; 82 m a.s.l.  
Coll. and subm. 1993 by H. Poutiainen.  
Ref. in Edgren et al., eds. (1996).

**Hel-3575 Sample 3, KM 28017:1943** 1070 ± 100  
Charcoal, depth 0.50 m  $\delta^{13}\text{C} = -25.0\%$

**Hel-3576 Sample 4, KM 28017:1944** 910 ± 90  
Charcoal, depth 0.55 m  $\delta^{13}\text{C} = -24.8\%$

**Hel-3577 BRAGENESET, SVALBARD** 8340 ± 120  
 $\delta^{13}\text{C} = +1.7\%$

Coll. 1955 and subm. 1994 by J. Donner.

Shells of *Astarte elliptica*

Comment (JD): The shells dated belong to the Brageneset series of shells from the till of the advance of Vestfonna against Brageneset between AD 1861 and 1899. The shells are from the time when the ice margin had retreated from Brageneset after the last glaciation, and were incorporated into the till of the young end-moraine during the re-advance of the ice.

Ref. Donner and West (1995).

### SEITLAX SERIES, PORVOO

14.20 m a.s.l.

Coll. and subm. 1994 by T. Jantunen.

General comment: See Hel-3347 in Jungner and Sonninen (1998).

Ref. Jantunen (1995).

**Hel-3578 Sample A, 30210** 4080 ± 110  
Gyttja and peat, depth 0.60-0.70 m  $\delta^{13}\text{C} = -20.0\%$

**Hel-3579 Sample C, 30210** 5160 ± 120  
Gyttja, depth 1.35-1.40 m  $\delta^{13}\text{C} = -20.9\%$

**Hel-3580**

See SAAMENMUSEO SERIES Hel-3566

**VUOAJA SERIES, INARI 13**

68°54'N, 27°01'E

Coll. and subm. 1994 by S-L. Seppälä.

General comment: See Vuopaja Series in Jungner and Sonninen (1996); see also Arponen and Hintikainen (1995).

Ref. In Edgren et al., eds. (1996).

**Hel-3581 Hearth 102/994 C** **5210 ± 140**  
 122.21 m a.s.l. **δ<sup>13</sup>C = -26.2‰**  
 Charcoal, depth 0.20 m

**Hel-3582 Hearth 116/994 D** **7110 ± 140**  
 123.05 m a.s.l. **δ<sup>13</sup>C = -26.4‰**  
 Charcoal, depth 0.25 m

**Hel-3583 Old podsol 116/998** **4490 ± 90**  
 123.05 m a.s.l. **δ<sup>13</sup>C = -26.2‰**  
 Charcoal, depth 0.15 m

**Hel-3584 Charcoal layer 120/998** **7600 ± 90**  
 122.96 m a.s.l. **δ<sup>13</sup>C = -26.2‰**  
 Charcoal, depth 0.50 m

**Hel-3585 Hearth 120/998 C** **7410 ± 100**  
 123.05 m a.s.l. **δ<sup>13</sup>C = -26.1‰**  
 Charcoal, depth 0.25 m

**Hel-3586 KALASATAMA, LOKAN TEKOJÄRVI** **-240 ± 100**  
**δ<sup>13</sup>C = -60.2‰**

Coll. and subm. 1994 by H. Nykänen.

Methane gas

**ENONTEKIÖ SERIES, ENONTEKIÖ**

Coll. 1993 by P. Halinen and subm. 1994 by P. Halinen and C. Carpelan

General comment (PH): The dates of these dwelling sites are as expected with the exception of Hel-3588 which is younger than suggested by the finds.

Ref. In Edgren et al., eds. (1996).

**Hel-3587 PH 1, Myllymaa 2, Enontekiö 210** **5790 ± 120**  
 68°21'N, 23°29'E; 287.10 m a.s.l. **δ<sup>13</sup>C = -26.3‰**  
 Charcoal, depth 0.05-0.10 m

**Hel-3588 PH 2, Pekkalanvaara, Enontekiö 114** **3490 ± 100**  
 68°22'N, 23°40'E; 293.62 m a.s.l. **δ<sup>13</sup>C = -26.3‰**  
 Charcoal, depth 0.08 m

<b>Hel-3589 PH 3, Suontajoki W 1, Enontekiö, 198</b> 68°22'N, 23°32'E; 290 m a.s.l. Charcoal, depth 0.15-0.20 m	<b>6940 ± 120</b> <b>δ<sup>13</sup>C = -26.2‰</b>
<b>Hel-3590 PH 4, Suontajoki W 3, Enontekiö 200</b> 68°22'N, 23°31'E; 299.5 m a.s.l. Charcoal, depth 0.15-0.20 m	<b>4280 ± 90</b> <b>δ<sup>13</sup>C = -26.2‰</b>
<b>Hel-3591 PH 5, Majava SW, Enontekiö 202</b> 68°22'N, 23°35'E; 288.5 m a.s.l. Charcoal, depth 0.05-0.10 m	<b>4210 ± 100</b> <b>δ<sup>13</sup>C = -26.8‰</b>
<b>Hel-3592 PH 6, Aittamaa 2, Enontekiö 195</b> 68°22'N, 23° 33'E; 290.25 m a.s.l. Charcoal, depth 0.05-0.10 m	<b>3870 ± 120</b> <b>δ<sup>13</sup>C = -26.7‰</b>
<b>Hel-3593 PH 7, Majava, Enontekiö 201</b> 68°22'N, 23°35'E; 291.5 m a.s.l. Charcoal, depth 0.20-0.25 m	<b>6570 ± 120</b> <b>δ<sup>13</sup>C = -26.7‰</b>
<b>Hel-3594 PH 8, Myllymaa 2, Enontekiö 210</b> 68°21'N, 23°29'E; 287.05 m Charcoal, depth 0.20-0.25 m	<b>6530 ± 140</b> <b>δ<sup>13</sup>C = -26.5‰</b>

## LÄNSI-POHJASSUO SERIES, POSIO

66°14'N, 28°31'E; 390-415 m a.s.l.

Coll. and subm. 1994 by A. Huttunen.

General comment (AH): The purpose of dating bottom samples from the mire is to gain more information about the rate of lateral expansion of the mire upward the slope (from LPS 1 to LPS 25). At the latter point, the bottom of a charcoal layer in the upper part of the turf dates to 290 ± 80 BP (LPS 25 B). Age differences between the adjacent (distance 30 m) dated sites in Länsi-Pohjassuo were conspicuous, varying from 170 to 5020 calibrated years, 1840 years on the average. The rate of lateral expansion varied within broad limits (0.059-0.173 m/a) being, however, rather small. The accumulation rates were in better agreement, 0.134-0.417 mm/a. A possibility of multinucleus genesis exists, especially at LPS 13-16.

<b>Hel-3595 LPS 1</b> Peat	<b>7840 ± 140</b> <b>δ<sup>13</sup>C = -26.9‰</b>
<b>Hel-3596 LPS 4</b> Peat	<b>8380 ± 150</b> <b>δ<sup>13</sup>C = -27.6‰</b>
<b>Hel-3597 LPS 7</b> Peat	<b>7510 ± 110</b> <b>δ<sup>13</sup>C = -29.0‰</b>
<b>Hel-3598 LPS 10</b> Peat	<b>5490 ± 100</b> <b>δ<sup>13</sup>C = -28.2‰</b>

<b>Hel-3599</b>	<b>LPS 13</b>	<b>2110 ± 100</b>
Peat		$\delta^{13}\text{C} = -27.8\text{‰}$
<b>Hel-3600</b>	<b>LPS 16</b>	<b>1970 ± 90</b>
Peat		$\delta^{13}\text{C} = -29.1\text{‰}$
<b>Hel-3601</b>	<b>LPS 19</b>	<b>3630 ± 100</b>
Peat		$\delta^{13}\text{C} = -28.6\text{‰}$
<b>Hel-3602</b>	<b>LPS 22</b>	<b>4430 ± 120</b>
Peat		$\delta^{13}\text{C} = -28.0\text{‰}$
<b>Hel-3603</b>	<b>LPS 25A</b>	<b>modern</b>
Peat		$\delta^{13}\text{C} = -26.7\text{‰}$
<b>Hel-3604</b>	<b>LPS 25B</b>	<b>290 ± 80</b>
Peat		$\delta^{13}\text{C} = -26.5\text{‰}$

## WESTERN DESERT SERIES, EGYPT

Coll. and subm. 1994-1997 by J. Donner.

General comment (JD): The samples of ostrich egg shell, mostly from playas in the Farafra Depression, date the early Holocene humid phase in the Western Desert of Egypt. Two dates of *Melania tuberculata* are too old because of the hard-water effect. Two samples of wood are about mid Holocene in age, whereas one sample of wood from a spring mound is modern. The sample of plant remains in calcrete dates a short-terms period of rains.

Ref. Donner et al (1999).

### El-Farafra

Playa south of Qasr El-Farafra

26°59'N, 27°57'E

<b>Hel-3607</b>	<b>Sample 3</b>	<b>6480 ± 120</b>
Ostrich egg shell		$\delta^{13}\text{C} = -3.9\text{‰}$
<b>Hel-3628</b>	<b>SF 1/3 (2 m below surface)</b>	<b>modern</b>
Wood		$\delta^{13}\text{C} = -24.4\text{‰}$
<b>Hel-3629</b>	<b>SF 1/1</b>	<b>18310 ± 280</b>
Gastropod shell, <i>Melania tuberculata</i>		$\delta^{13}\text{C} = -5.4\text{‰}$
<b>Hel-3630</b>	<b>SF 1/2</b>	<b>8220 ± 140</b>
Ostrich egg shell		$\delta^{13}\text{C} = -4.1\text{‰}$
<b>Hel-3765</b>	<b>Farafra, Sample 13</b>	<b>8970 ± 110</b>
Ostrich egg shell		$\delta^{13}\text{C} = -1.4\text{‰}$



<b>Hel-3766 Farafra, Sample 12</b> Ostrich egg shell	<b>6390 ± 100</b> $\delta^{13}\text{C} = -4.4\%$
<b>Hel-3767 Farafra, Sample 9</b> Ostrich egg shell	<b>7320 ± 100</b> $\delta^{13}\text{C} = -3.8\%$
<b>Hel-3768 Farafra, Sample 15</b> Ostrich egg shell	<b>6880 ± 100</b> $\delta^{13}\text{C} = -3.3\%$
<b>Hel-3769 Farafra, Sample 8</b> Ostrich egg shell	<b>8310 ± 100</b> $\delta^{13}\text{C} = -4.6\%$
<b>Hel-3811 Farafra E 12</b> Gastropod shell, <i>Melania tuberculata</i>	<b>19700 ± 300</b> $\delta^{13}\text{C} = -5.7\%$
<b>Hel-4003 Farafra SF 1/Sample 5</b> Ostrich egg shell	<b>7840 ± 110</b> $\delta^{13}\text{C} = -3.4\%$
<b>Hel-4130 Sample 1</b> Ostrich egg shell	<b>9090 ± 110</b> $\delta^{13}\text{C} = -5.6\%$
<b>Hel-4131 Sample 5</b> Ostrich egg shell	<b>7500 ± 100</b> $\delta^{13}\text{C} = -4.0\%$
<b>Hel-4132 Sample 4</b> Ostrich egg shell	<b>6010 ± 100</b> $\delta^{13}\text{C} = -4.6\%$

Mound of sediment N of Qasr El-Farafra  
27°06'N, 27°59'E

<b>Hel-3605 Sample 1</b> Wood from top of 4 m high mound	<b>4850 ± 100</b> $\delta^{13}\text{C} = -25.2\%$
<b>Hel-3606 Sample 2</b> Wood from same mound	<b>4260 ± 90</b> $\delta^{13}\text{C} = -23.7\%$

Playa N of Qasr El-Farafra  
27°11'N, 28°03'E

<b>Hel-3631 NF 2/1</b> Ostrich egg shell	<b>8280 ± 140</b> $\delta^{13}\text{C} = -4.5\%$
<b>Hel-3812 Farafra E 13</b> Ostrich egg shell	<b>8440 ± 120</b> $\delta^{13}\text{C} = -4.8\%$

Playa E of Qasr El-Farafra  
27°03'N, 28°02'E

<b>Hel-3813 Farafra E 15</b> Ostrich egg shell	<b>8650 ± 110</b> $\delta^{13}\text{C} = -2.7\%$
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Ain El-Raml, playa SW of Qasr El-Farafra  
27°02'N, 27°57'E

**Hel-4004 Ain El-Raml /Sample 2** 9140 ± 110  
Ostrich egg shell  $\delta^{13}\text{C} = -4.9\%$

Section at Guest House, Qasr El-Farafra  
27°04'N, 27°58'E

**Hela-30 Sample** 665 ± 60  
Plant remains in calcrete, depth 0.70 m  $\delta^{13}\text{C} = -12.2\%$

### Bahariya

Playa at El Heiz  
28°02'N, 28°41'E

**Hel-3632 Bahariya, El Heiz, Egypt** 7810 ± 130  
Ostrich egg shell  $\delta^{13}\text{C} = -6.0\%$

### Djara Cave area

Shallow stream channel  
27°24'N, 29°38'E

**Hel-4001 Egypt 1/96** 8730 ± 110  
Ostrich egg shell  $\delta^{13}\text{C} = -7.0\%$

Upstream in same channel

**Hel-4002 Egypt 2/96** 5450 ± 90  
Ostrich egg shell  $\delta^{13}\text{C} = -6.2\%$

Djara Cave site  
27°24'N, 29°38'E

**Hel-4005 Djara Cave site/Sample 1** 7410 ± 110  
Ostrich egg shell  $\delta^{13}\text{C} = -4.2\%$

**Hel-4006 Djara Cave site/Sample 3** 7600 ± 100  
Ostrich egg shell  $\delta^{13}\text{C} = -5.4\%$

**Hel-4007 Djara Cave site/Sample 4** 7630 ± 110  
Ostrich egg shell  $\delta^{13}\text{C} = -5.8\%$

Small shallow playas

**Hel-4008 Djara Playa C/Sample 6** 9670 ± 110  
27°24'N, 29°39'E  $\delta^{13}\text{C} = -6.4\%$   
Ostrich egg shell

**Hel-4009 Djara Playa F/Sample 7**  
 27°25'N, 29°39'E  
 Ostrich egg shell

**7900 ± 110**  
 $\delta^{13}\text{C} = -5.2\%$

## SUOSILMU PROJECT

Coll. 1993-1996 by J. Turunen and subm. 1995-1996 by K. Tolonen.  
 Ref. Korhola et al. (1995), Tolonen and Turunen (1996), Clymo et al. (1998),  
 Pitkänen et al. (1999), Turunen et al. (1999).

### Ahvensalo Series, Ilomantsi

62°51'N, 30°53'E; 160 m a.s.l.

**Hel-3608 LS1**  
 Peat Pr-N-S-C, H5, depth 3.45-3.50 m

**5280 ± 110**  
 $\delta^{13}\text{C} = -24.6\%$

**Hel-3609 LS2**  
 Peat Eq-L-C-S, H5, depth 3.30-3.35 m

**5090 ± 100**  
 $\delta^{13}\text{C} = -27.0\%$

### Patvinsuo Series I, Lieksa

**Hel-3610 C500**  
 63°05'N, 30°45'E; 150 m a.s.l.  
 Peat C, H7, depth 0.70-0.75 m

**6140 ± 130**  
 $\delta^{13}\text{C} = -28.4\%$

**Hel-3611 B600**  
 63°06'N, 30°45'E; 155 m a.s.l.  
 Peat L-ER-S, H8, depth 1.65-1.70 m

**7020 ± 120**  
 $\delta^{13}\text{C} = -29.4\%$

**Hel-3612 D900**  
 63°06'N, 30°38'E; 165 m a.s.l.  
 Peat C-S-B, H3, depth 2.90-2.95 m

**9510 ± 180**  
 $\delta^{13}\text{C} = -28.1\%$

**Hel-3613 W600A**  
 63°06'N, 30°40'E; 160 m a.s.l.  
 Peat Er-S-C, H7, depth 1.90-1.95 m

**7160 ± 100**  
 $\delta^{13}\text{C} = -28.8\%$

**Hel-3614 A0**  
 63°04'N, 30°47'E; 150 m a.s.l.  
 Peat Pr-Eq-B, H3, depth 2.95-3.00 m

**8130 ± 150**  
 $\delta^{13}\text{C} = -29.5\%$

**Hel-3615 F400**  
 63°07'N, 30°40'E; 161 m a.s.l.  
 Peat L-C, H6, depth 2.65-2.70 m

**7430 ± 130**  
 $\delta^{13}\text{C} = -28.3\%$

**Lakkasuo Series, Orivesi**

61°47'N, 24°18'E

<b>Hel-3739 A50</b> 155 m a.s.l. Peat L-Er-C-S, H6-7, depth 2.39-2.46 m	<b>3990 ± 100</b> $\delta^{13}\text{C} = -28.7\text{‰}$
<b>Hel-3740 A10</b> 156 m a.s.l. Peat L-S, H7-8, depth 0.61-0.65 m	<b>1580 ± 90</b> $\delta^{13}\text{C} = -28.7\text{‰}$
<b>Hel-3741 A8</b> 156 m a.s.l. Peat L-S, H7-8, depth 0.32-0.37 m	<b>660 ± 80</b> $\delta^{13}\text{C} = -28.3\text{‰}$
<b>Hel-3742 A14</b> 156 m a.s.l. Peat L-C-S, H8, depth 0.85-0.91 m	<b>1820 ± 90</b> $\delta^{13}\text{C} = -28.6\text{‰}$
<b>Hel-3743 A16</b> 156 m a.s.l. Peat L-S, H8-10, depth 0.90-0.97 m	<b>1790 ± 90</b> $\delta^{13}\text{C} = -28.3\text{‰}$
<b>Hel-3744 A19</b> 156 m a.s.l. Peat L-S, H8-9, depth 1.43-1.50 m	<b>2860 ± 120</b> $\delta^{13}\text{C} = -28.0\text{‰}$
<b>Hel-3745 A21</b> 155 m a.s.l. Peat L-Er-S, H8-9, depth 1.45-1.52 m	<b>2680 ± 90</b> $\delta^{13}\text{C} = -28.9\text{‰}$
<b>Hel-3746 A25</b> 155 m a.s.l. Peat L-S, H8-9, depth 1.82-1.89 m	<b>2840 ± 80</b> $\delta^{13}\text{C} = -28.8\text{‰}$
<b>Hel-3814 Lakka0</b> 152 m a.s.l. Peat Eq-L-C, H5, depth 0.35-0.40 m	<b>1450 ± 90</b> $\delta^{13}\text{C} = -29.5\text{‰}$
<b>Hel-3815 A100</b> 154 m a.s.l. Peat Eq-L-C-S, H8, depth 2.30-2.35 m	<b>3930 ± 70</b> $\delta^{13}\text{C} = -28.5\text{‰}$
<b>Hel-3816 A40</b> 155 m a.s.l. Peat Er-C-S, H7, depth 2.35-2.40 m	<b>3570 ± 110</b> $\delta^{13}\text{C} = -28.6\text{‰}$
<b>Hel-3817 Lakka16</b> 156 m a.s.l. Peat Er-S-C, H7, depth 1.45-1.50 m	<b>8100 ± 130</b> $\delta^{13}\text{C} = -28.2\text{‰}$

**Patvinsuo Series II, Lieksa**

<b>Hel-3791 Surkansuo 23</b> Peat L-S, H8, depth 1.25-1.30 m	<b>3380 ± 100</b> $\delta^{13}\text{C} = -28.8\text{‰}$
<b>Hel-3792 Surkansuo 24</b> Peat L-S, H8, depth 1.55-1.60 m	<b>4930 ± 110</b> $\delta^{13}\text{C} = -28.2\text{‰}$
<b>Hel-3793 Surkansuo 25</b> Peat Er-S, H7, depth 0.95-1.00 m	<b>3110 ± 110</b> $\delta^{13}\text{C} = -28.7\text{‰}$
<b>Hel-3794 Surkansuo 26</b> Peat L-S, H9, depth 3.95-4.00 m	<b>4510 ± 100</b> $\delta^{13}\text{C} = -31.3\text{‰}$
<b>Hel-3795 Surkansuo 27</b> Peat L-Er-S, H7, depth 1.85-1.90 m	<b>7550 ± 110</b> $\delta^{13}\text{C} = -29.1\text{‰}$

**Patvinsuo Series III, Lieksa**

<b>Hel-3800 B100</b> 153 m a.s.l. Peat L-Er-S, H8, depth 1.00-1.05 m	<b>3120 ± 100</b> $\delta^{13}\text{C} = -28.9\text{‰}$
<b>Hel-3801 B100</b> 153 m a.s.l. Peat L-Er-S, H8, depth 1.05-1.10 m	<b>4970 ± 100</b> $\delta^{13}\text{C} = -29.2\text{‰}$
<b>Hel-3802 B600</b> 153 m a.s.l. Peat L-Er-S, H8-9, depth 1.60-1.65 m	<b>6450 ± 100</b> $\delta^{13}\text{C} = -28.8\text{‰}$
<b>Hel-3803 C500</b> 150 m a.s.l. Peat C, H7-8, depth 0.80-0.85 m	<b>4060 ± 110</b> $\delta^{13}\text{C} = -29.8\text{‰}$
<b>Hel-3804 D100</b> 164 m a.s.l. Peat L-Er-S, H5-6, depth 0.95-1.00 m	<b>4140 ± 100</b> $\delta^{13}\text{C} = -29.1\text{‰}$
<b>Hel-3805 D100</b> 164 m a.s.l. Peat L-Er-S, H6, depth 1.00-1.04 m	<b>4710 ± 110</b> $\delta^{13}\text{C} = -28.6\text{‰}$
<b>Hel-3806 Lintu</b> 151 m a.s.l. Peat C, H7-8, depth 0.65-0.70 m	<b>3730 ± 100</b> $\delta^{13}\text{C} = -29.7\text{‰}$
<b>Hel-3807 Lintu</b> 151 m a.s.l. Peat C, H7-8, depth 0.70-0.75 m	<b>4810 ± 110</b> $\delta^{13}\text{C} = -29.5\text{‰}$

<b>Hel-3808 K+100</b>	<b>3770 ± 80</b>
151 m a.s.l.	$\delta^{13}\text{C} = -28.4\%$
Peat Er-C-S, H9, depth 0.50-0.585	
<b>Hel-3809 K0</b>	<b>4580 ± 110</b>
151 m a.s.l.	$\delta^{13}\text{C} = -29.1\%$
Peat Er-S, H8, depth 0.93-1.00 m	
<b>Hel-3810 C400</b>	<b>3840 ± 90</b>
151 m a.s.l.	$\delta^{13}\text{C} = -29.9\%$
Peat C, H6, depth 0.45-0.515 m	

#### Patvinsuo Series IV, Lieksa

<b>Hel-3889 Pav</b>	<b>7530 ± 120</b>
158 m a.s.l.	$\delta^{13}\text{C} = -28.6\%$
Peat Er-S-C, H6-7, depth 1.85-1.90 m	
<b>Hel-3890 Pav</b>	<b>7900 ± 120</b>
158 m a.s.l.	$\delta^{13}\text{C} = -28.9\%$
Peat Er-S-C, H6-7, depth 1.95-2.00 m	
<b>Hel-3891 D400</b>	<b>7140 ± 110</b>
163 m a.s.l.	$\delta^{13}\text{C} = -29.2\%$
Peat C, H5, depth 1.40-1.45 m	
<b>Hel-3892 D400</b>	<b>7960 ± 150</b>
163 m a.s.l.	$\delta^{13}\text{C} = -29.3\%$
Peat C, H5, depth 1.45-1.50 m	
<b>Hel-3893 D900</b>	<b>8900 ± 150</b>
162 m a.s.l.	$\delta^{13}\text{C} = -27.6\%$
Peat C-S-B, H8, depth 2.85-2.90 m	
<b>Hel-3894 E200</b>	<b>8980 ± 120</b>
168 m a.s.l.	$\delta^{13}\text{C} = -28.7\%$
Peat S-C, H4, depth 2.90-2.95 m	
<b>Hel-3895 E200</b>	<b>8930 ± 160</b>
165 m a.s.l.	$\delta^{13}\text{C} = -27.5\%$
Peat S-C, H4, depth 2.95-3.00 m	
<b>Hel-3896 E400</b>	<b>8350 ± 140</b>
166 m a.s.l.	$\delta^{13}\text{C} = -27.6\%$
Peat C-S, H7-8, depth 2.40-2.45 m	
<b>Hel-3897 E400</b>	<b>8700 ± 160</b>
166 m a.s.l.	$\delta^{13}\text{C} = -27.9\%$
Peat C-S, H7-8, depth 2.45-2.50 m	

<b>Hel-3898 A0</b> 150 m a.s.l. Peat Pr-Eq-B, H3, depth 2.90-2.95 m	9040 ± 100 $\delta^{13}\text{C} = -29.4\%$
<b>Hel-3899 F400</b> 160 m a.s.l. Peat L-C, H6-7, depth 2.60-2.65 m	7650 ± 100 $\delta^{13}\text{C} = -29.7\%$
<b>Hel-3900 F800</b> 158 m a.s.l. Peat Eq-B, H3-4, depth 2.90-2.95 m	9260 ± 180 $\delta^{13}\text{C} = -26.2\%$
<b>Hel-3901 F800</b> 158 m a.s.l. Peat Eq-B, H3-4, depth 2.95-3.00 m	8730 ± 120 $\delta^{13}\text{C} = -28.6\%$

### Separate Suosilmu samples

<b>Hel-3700 JT7, Oisavansuo, Muhos</b> 70 m a.s.l. Peat Eq-B-C, H8, depth 1.55-1.60 m	2860 ± 80 $\delta^{13}\text{C} = -29.3\%$
<b>Hel-3701 JT8, Siivilänniemenaapa, Simo</b> 96 m a.s.l. Peat C-S, H4, depth 1.77-1.82 m	6420 ± 110 $\delta^{13}\text{C} = -28.5\%$
<b>Hel-3702 JT9, Simo</b> 130 m a.s.l. Peat Pr-L-B-C, H9, depth 0.87-0.92 m	6290 ± 110 $\delta^{13}\text{C} = -27.6\%$
<b>Hel-3703 JT10, Korkeakorpi, Kemi</b> 18 m a.s.l. Peat L-S, H8, depth 0.65-0.70 m	1690 ± 70 $\delta^{13}\text{C} = -28.4\%$
<b>Hel-3704 JT11, Torviaapa, Kemi</b> 25 m a.s.l. Peat L-Eq-Pr-C, H8, depth 0.90-0.95 m	2110 ± 90 $\delta^{13}\text{C} = -28.5\%$
<b>Hel-3705 JT12, Riihisuo, Pieksämäki</b> 123 m a.s.l. Peat S, H10, depth 1.70-1.75 m	8150 ± 100 $\delta^{13}\text{C} = -28.7\%$
<b>Hel-3706 JT13, Juurikkasuo, Pieksämäki</b> 120 m a.s.l. Peat Pr-Eq-B-S, H8, depth 1.65-1.70 m	7010 ± 100 $\delta^{13}\text{C} = -27.6\%$
<b>Hel-3707 JT14, Vehvaansuo, Pieksämäki</b> 106 m a.s.l. Peat L-C-S, H8, depth 1.65-1.70 m	6790 ± 90 $\delta^{13}\text{C} = -29.3\%$

<b>Hel-3708</b>	<b>JT15, Paritsansuo, Joensuu</b> 81 m a.s.l. Peat L-Pr-S-C, H9, depth 1.30-1.35 m	<b>3425 ± 100</b> $\delta^{13}\text{C} = -23.0\%$
<b>Hel-3749</b>	<b>Annanlamminneva, Merikarvia</b> 24.30 m a.s.l. Peat L-B-C, H8, depth 2.25-2.30 m	<b>2260 ± 90</b> $\delta^{13}\text{C} = -27.8\%$
<b>Hel-3750</b>	<b>Kräsmosanneva, Merikarvia</b> 20.20 m a.s.l. Peat L-C, H5, depth 2.65-2.70 m	<b>1930 ± 100</b> $\delta^{13}\text{C} = -29.8\%$
<b>Hel-3751</b>	<b>Kräsmosanneva, Merikarvia</b> 20.70 m a.s.l. Peat L-Eq-B-C, H5, depth 1.90-1.95 m	<b>1590 ± 100</b> $\delta^{13}\text{C} = -27.8\%$
<b>Hel-3752</b>	<b>Hellunkeidas, Tuorila</b> 30 m a.s.l. Peat L-C-S, H9, depth 3.35-3.40 m	<b>2670 ± 90</b> $\delta^{13}\text{C} = -29.5\%$
<b>Hel-3753</b>	<b>Lapponneva, Merikarvia</b> 2.40 m a.s.l. Peat Pr-S, H3, depth 0.97-1.02 m	<b>630 ± 100</b> $\delta^{13}\text{C} = -26.6\%$
<b>Hel-3754</b>	<b>Haukijärvenkeidas, Tuorila</b> 39.90 m a.s.l. Peat Pr-Eq-C, H8, depth 3.25-3.30 m	<b>4110 ± 130</b> $\delta^{13}\text{C} = -29.3\%$
<b>Hel-3755</b>	<b>Haukijärvenkeidas, Tuorila</b> 40 m a.s.l. Peat Pr-Eq-C, H4, depth 3.55-3.60 m	<b>3940 ± 120</b> $\delta^{13}\text{C} = -28.2\%$
<b>Hel-3756</b>	<b>Mäntyneva, Tuorila</b> 43.80 m a.s.l. Peat Pr-S-C, H6, depth 2.65-2.70 m	<b>4230 ± 110</b> $\delta^{13}\text{C} = -26.7\%$
<b>Hel-3757</b>	<b>Urstinneva, Tuorila</b> 41.5 m a.s.l. Peat L-C-S, H9, depth 3.65-3.70 m	<b>4010 ± 120</b> $\delta^{13}\text{C} = -28.0\%$
<b>Hel-3758</b>	<b>Urstinneva, Tuorila</b> 42.10 m a.s.l. Peat Eq-C-S, H9, depth 3.05-3.10 m	<b>3200 ± 90</b> $\delta^{13}\text{C} = -30.2\%$
<b>Hel-3759</b>	<b>Rösmosa, Riispyy</b> 25.90 m a.s.l. Peat Eq-Sch-S-C, H5, depth 3.25-3.30 m	<b>2480 ± 110</b> $\delta^{13}\text{C} = -25.8\%$
<b>Hel-3760</b>	<b>Koivumäenkeidas, Kuvaskangas</b> 46.60 m a.s.l. Peat L-Eq-S, H9, depth 4.03-4.08 m	<b>4330 ± 100</b> $\delta^{13}\text{C} = -29.9\%$



<b>Hel-3761 Pohjuskeidas, Kuvaskangas</b> 49.30 m a.s.l. Peat Eq-C, H9, depth 4.50-4.55 m	<b>4010 ± 90</b> $\delta^{13}\text{C} = -28.9\%$
<b>Hel-3762 Leppineva, Leppijärvi</b> 62.20 m a.s.l. Peat Pr-L-C, H8, depth 3.85-3.90 m	<b>4420 ± 100</b> $\delta^{13}\text{C} = -29.9\%$
<b>Hel-3763 Kirkkokeidas, Silkainen</b> 56 m a.s.l. Peat L-Eq-S-C, H8, depth 3.85-3.90 m	<b>3870 ± 100</b> $\delta^{13}\text{C} = -29.6\%$
<b>Hel-3764 Korvenneva, Riispyy</b> 37.10 m a.s.l. Peat Sch-S-C, H4, depth 4.05-4.10 m	<b>3490 ± 100</b> $\delta^{13}\text{C} = -27.5\%$
<b>Hel-3770 Heitonneva, Kuvaskangas</b> 46.5 m a.s.l. Peat Pr-C-S, H5, depth 5.05-5.10 m	<b>4560 ± 100</b> $\delta^{13}\text{C} = -27.3\%$
<b>Hel-3771 Ristikeldas, Sammi</b> 72.5 m a.s.l. Peat Er-S-C, H8, depth 3.90-3.95 m	<b>5600 ± 90</b> $\delta^{13}\text{C} = -26.2\%$
<b>Hel-3772 Muurainsuo, Luvia</b> 6.60 m a.s.l. Peat Eq-N-C, H4, depth 1.60-1.65 m	<b>920 ± 80</b> $\delta^{13}\text{C} = -28.1\%$
<b>Hel-3773 Inari II, Inari</b> 205 m a.s.l. Peat C-B, H4, depth 1.45-1.50 M	<b>5280 ± 100</b> $\delta^{13}\text{C} = -27.7\%$
<b>Hel-3774 Inari II, Inari</b> 205 m a.s.l. Peat Eq-C-B, H3, depth 2.45-2.50 m	<b>6310 ± 100</b> $\delta^{13}\text{C} = -27.9\%$
<b>Hel-3775 Inari II, Inari</b> 205 m a.s.l. Peat Eq-C-B, H3, depth 3.45-3.50 m	<b>7810 ± 110</b> $\delta^{13}\text{C} = -28.4\%$
<b>Hel-3776 Inari II, Inari</b> 205 m a.s.l. Peat Eq-C, H5, depth 4.45-4.50 m	<b>9140 ± 110</b> $\delta^{13}\text{C} = -26.7\%$
<b>Hel-3782 Vuotos 221a, Pelkosenniemi</b> 160 m a.s.l. Peat N-S, H6, depth 0.38-0.40 m	<b>1020 ± 90</b> $\delta^{13}\text{C} = -28.5\%$

<b>Hel-3783 Vuotos 22Ib, Pelkosenniemi</b> 160 m a.s.l. Peat L-Eq-B-C, H6, depth 1.55-1.60 m	<b>4530 ± 110</b> $\delta^{13}\text{C} = -28.5\text{‰}$
<b>Hel-3784 Vuotos 22A, Pelkosenniemi</b> 160 m a.s.l. Peat Eq-C, H7, depth 0.95-1.00 m	<b>3950 ± 110</b> $\delta^{13}\text{C} = -29.7\text{‰}$
<b>Hel-3785 Vuotos 22C, Pelkosenniemi</b> 160 m a.s.l. Peat C-S, H7, depth 0.85-0.90 m	<b>4380 ± 80</b> $\delta^{13}\text{C} = -29.1\text{‰}$
<b>Hel-3786 Vuotos 22D, Pelkosenniemi</b> 160 m a.s.l. Peat N-S-C, H6, depth 1.45-1.50 m	<b>5120 ± 110</b> $\delta^{13}\text{C} = -29.9\text{‰}$
<b>Hel-3787 Vuotos 22E, Pelkosenniemi</b> 160 m a.s.l. Peat Eq-C-B, H3, depth 2.75-2.80 m	<b>8810 ± 140</b> $\delta^{13}\text{C} = -27.5\text{‰}$
<b>Hel-3788 Vuotos 22F, Pelkosenniemi</b> 160 m a.s.l. Peat Eq-L-C-S, H5, depth 2.90-2.95 m	<b>7330 ± 110</b> $\delta^{13}\text{C} = -28.8\text{‰}$
<b>Hel-3789 Vuotos 22G, Pelkosenniemi</b> 160 m a.s.l. Peat L-B-C, H5, depth 2.50-2.55 m	<b>7960 ± 100</b> $\delta^{13}\text{C} = -29.6\text{‰}$
<b>Hel-3790 Vuotos 22J, Pelkosenniemi</b> 160 m a.s.l. Peat Eq-L-S-C, H5, depth 1.15-1.20 m	<b>3520 ± 110</b> $\delta^{13}\text{C} = -29.1\text{‰}$
<b>Hel-3818 Onki2, Utra</b> 83 m a.s.l. Peat Pr-C-B, H5, depth 1.35-1.40 m	<b>4510 ± 100</b> $\delta^{13}\text{C} = -28.1\text{‰}$
<b>Hel-3819 Vehva 1000+200, Pieksämäki</b> 107 m a.s.l. Peat Er-C-S, H9, depth 0.95-1.00 m	<b>2230 ± 110</b> $\delta^{13}\text{C} = -28.6\text{‰}$
<b>Hel-3820 Pässirova 16, Inari</b> 152 m a.s.l. Peat C, H6, depth 0.75-0.80 m	<b>5570 ± 140</b> $\delta^{13}\text{C} = -28.3\text{‰}$
<b>Hel-3821 Pässirova 16, Inari</b> 152 m a.s.l. Peat Eq-C, H7, depth 0.85-0.90 m	<b>6940 ± 120</b> $\delta^{13}\text{C} = -28.7\text{‰}$

<b>Hel-3822</b>	<b>Pässirova 17, Inari</b> 152 m a.s.l. Peat B-C, H4, depth 1.07-1.12 m	<b>5400 ± 110</b> $\delta^{13}\text{C} = -29.0\%$
<b>Hel-3823</b>	<b>Pässirova 17, Inari</b> 152 m a.s.l. Peat C, H5, depth 1.17-1.22 m	<b>5410 ± 80</b> $\delta^{13}\text{C} = -28.3\%$
<b>Hel-3842</b>	<b>Pässirova 18, Inari</b> 152 m a.s.l. Peat Eq-B-C, H4, depth 0.85-0.90 m	<b>4860 ± 100</b> $\delta^{13}\text{C} = -28.1\%$
<b>Hel-3843</b>	<b>Pässirova 18, Inari</b> 152 m a.s.l. Peat Eq-B-C, H4, depth 0.95-1.00 m	<b>5780 ± 110</b> $\delta^{13}\text{C} = -27.8\%$
<b>Hel-3844</b>	<b>Pässirova 19, Inari</b> 152 m a.s.l. Peat B-C, H5, depth 1.20-1.25 m	<b>5640 ± 110</b> $\delta^{13}\text{C} = -28.1\%$
<b>Hel-3845</b>	<b>Pässirova 19, Inari</b> 152 m a.s.l. Peat Pr-Eq-C, H6, depth 1.30-1.35 m	<b>7060 ± 110</b> $\delta^{13}\text{C} = -28.5\%$
<b>Hel-3846</b>	<b>Pässirova x3, Inari</b> 152 m a.s.l. Peat S-C, H7, depth 1.35-1.40 m	<b>5280 ± 100</b> $\delta^{13}\text{C} = -28.9\%$
<b>Hel-3847</b>	<b>Pässirova x3, Inari</b> 152 m a.s.l. Peat S-C, H7, depth 1.45-1.50 m	<b>7250 ± 120</b> $\delta^{13}\text{C} = -29.8\%$

#### IFJORD SERIES, NORWAY

70°26'N, 27°38'E; 317 m a.s.l.  
Coll. 1993 and subm. 1994 and 1995 by H. Seppä.  
Ref. Seppä (1996).

<b>Hel-3616</b>	<b>Lake Ifjord 700</b> Gyttja, depth 7.00 m	<b>6400 ± 110</b> $\delta^{13}\text{C} = -29.1\%$
<b>Hel-3617</b>	<b>Lake Ifjord 760</b> Gyttja, depth 7.60 m	<b>8290 ± 140</b> $\delta^{13}\text{C} = -29.6\%$
<b>Hel-3618</b>	<b>Lake Ifjord 780</b> Gyttja, depth 7.80 m	<b>9360 ± 100</b> $\delta^{13}\text{C} = -28.4\%$
<b>Hel-3619</b>	<b>Lake Ifjord 845</b> Gyttja, depth 8.45 m	<b>10600 ± 190</b> $\delta^{13}\text{C} = -21.0\%$

**Hel-3643 Lake Ifjord 634**  
70°55'N, 27°25'E, 317 m a.s.l.  
Gyttja, depth 6.34 m

**3440 ± 90**  
 **$\delta^{13}\text{C} = -29.6\%$**

### **ABOA VETUS SERIES, TURKU**

Coll. and subm. 1994 by K. Uotila.  
Ref. Uotila (1998).

**Hel-3620 Sample 7**  
Charcoal

**780 ± 70**  
 **$\delta^{13}\text{C} = -23.3\%$**

**Hel-3621 Sample 8**  
Charcoal and wood

**810 ± 70**  
 **$\delta^{13}\text{C} = -23.0\%$**

**Hel-3624 Sample 19**  
Mortar

**470 ± 60**  
 **$\delta^{13}\text{C} = -16.2\%$**

**Hel-3625 Sample 32**  
Mortar

**340 ± 60**  
 **$\delta^{13}\text{C} = -16.8\%$**

### **Hel-3622 KIVIVAARA, ENONTEKIÖ**

**3820 ± 80**

68°25'N, 24°30'E

**$\delta^{13}\text{C} = -23.1\%$**

A wood sample coll. and subm. 1994 by T. Kurkela.

Comment (TK): Based on dendrochronology the sample should be either 1000 or 7000 years old.

### **KARELIAN ISTHMUS SERIES, RUSSIA**

General comment (PU): These are the results of a limited dating program carried out as part of a study of the Bronze and Iron Ages in the former Finnish part of the Karelian Isthmus. The names given below are the traditional Finnish names; the current Russian names of the municipalities are given in parentheses.

Ref. Uino (1997).

**Hel-3623 Naskalinmäki, Lapinlahti,**  
**Sakkola (Ol'hovka)**

**890 ± 70**  
 **$\delta^{13}\text{C} = -24.4\%$**

60°38'N, 30°19'E; 40 m a.s.l.

Coll. 1921 by A. Europæus and subm. 1994 by P. Uino.

KM 7901:26, charcoal, depth 0.60 m

Comment (PU): Sample taken from burial stone structure (low cairn or level ground cremation cemetery). The C-14 Age (calibrated to AD 1040-1240) is younger than the age assigned to the most of the artefacts (AD 700-900), which suggests the later activity at the site.

- Hela-8 Hovinsaari, Kalmistomäki, Räsälä (Mel'nikovo)** **2360 ± 70**  
 $\delta^{13}\text{C} = -26.1\%$   
 60°55'N, 29°46'E; 15 m a.s.l.  
 Coll. 1887-88 by Th. Schvindt and subm 1994 by P. Uino.  
 KM 2556, charred crust  
 Comment (PU): Samples of charred crust from ceramic vessels. Hela-8 represents Luukonsaari asbestos ware. Hela-9 and Hela-10 represent Iron Age type pottery. The archaeological datings agree with the results from radiocarbon dating.
- Hela-9 Hovinsaari, Tontinmäki, Räsälä (Mel'nikovo/Krotovo)** **1350 ± 65**  
 $\delta^{13}\text{C} = -25.3\%$   
 60°55'N, 30°02'E; 10-15 m a.s.l.  
 KM 2592:146, charred crust  
 Comment: See Hela-8.
- Hela-10 Unnunkoski, Räsälä (Mel'nikovo/Gori)** **1280 ± 65**  
 $\delta^{13}\text{C} = -28.8\%$   
 60°58'N, 29°50'E; 10-15 m a.s.l.  
 KM 2594, charred crust  
 Comment: See Hela-8.
- Hela-11 Suotniemi, Käkisalmi (Priozersk/Yarkoye)** **1490 ± 65**  
 $\delta^{13}\text{C} = -25.0\%$   
 61°02'N, 30°07'E; 15 m a.s.l.  
 Coll. 1991 by P. Uino and A. I. Saksa, subm 1994 by P. Uino.  
 Charred crust, depth 0.25-0.35 m  
 Comment (PU): Charred crust from Iron Age type pottery. The C-14 age indicates that there has been activity at the site already in the 6th-7th centuries AD. The neighboring Suotniemi cemetery is dated to the 12th-13th centuries.
- Hela-13 Käkisalmi Fortress (Priozersk)** **910 ± 75**  
 $\delta^{13}\text{C} = -23.6\%$   
 61°01'N, 30°08'E; 5-10 m a.s.l.  
 Coll. 1990 by P. Uino and A. I. Saksa, subm 1994 by P. Uino.  
 Seed, depth 1.80-2.00 m  
 Comment (PU): This C-14 age is younger than other radiocarbon dates from the Käkisalmi Fortress. The earliest archaeological finds from this site date to the 8th century AD.  
 Ref. Kankainen et al. (1995), Uino (1997).

**Hel-3624 – Hel-3625** See ABOA VETUS SERIES Hel-3620

#### **PASKOLAMPI SERIES, YLIKIIMINKI**

65°05'N, 26°15'E; 82.80 m a.s.l.  
 Coll. 1994 and subm. 1995 by H. Hellsten.

**Hel-3626 Paskolampi 406-411 cm + I** **5520 ± 140**  
 $\delta^{13}\text{C} = -33.1\%$   
 Gyttja, depth 4.06-4.11 m

**Hel-3627 Paskolampi 411-416 cm + I**  
Gyttja, depth 4.11-4.16 m

**5520 ± 130**  
 **$\delta^{13}\text{C} = -32.1\%$**

**Hel-3628 - Hel-3632** See WESTERN DESERT SERIES Hel-3607

### LAKKASUO SERIES, ORIVESI

61°48'N, 24°19'E; 150 m a.s.l.

Coll. 1994 by S. Jauhiainen, V-M. Komulainen and E. Tuittila.,  
subm. 1995 by J. Laine.

Ref. Laine and Minkkinen (1996), Minkkinen et al. (1999).

#### 2L25 (I)

**Hel-3633**  
Peat, depth 1.00-1.05 m

**1590 ± 110**  
 **$\delta^{13}\text{C} = -27.7\%$**

**Hel-3635**  
Peat, depth 1.79-1.84 m

**3520 ± 100**  
 **$\delta^{13}\text{C} = -29.8\%$**

**Hel-3636**  
Peat, depth 1.84-1.89 m

**4180 ± 110**  
 **$\delta^{13}\text{C} = -29.0\%$**

**Hel-3637**  
Peat, depth 1.89-1.945 m (= bottom)

**4760 ± 100**  
 **$\delta^{13}\text{C} = -29.8\%$**

#### 2L25 (II)

**Hel-3645**  
Peat, depth 1.00-1.05 m

**1720 ± 90**  
 **$\delta^{13}\text{C} = -27.6\%$**

**Hel-3646**  
Peat, depth 1.43-1.48 m

**2690 ± 100**  
 **$\delta^{13}\text{C} = -28.4\%$**

**Hel-3647**  
Peat, depth 1.815-1.865 m

**3830 ± 90**  
 **$\delta^{13}\text{C} = -29.4\%$**

**Hel-3648**  
Peat, depth 1.865-1.915 m

**4150 ± 100**  
 **$\delta^{13}\text{C} = -29.2\%$**

**Hel-3649**  
Peat, depth 1.915-1.965 m

**5530 ± 100**  
 **$\delta^{13}\text{C} = -29.9\%$**

#### 3L25 (I)

**Hel-3650**  
Peat, depth 1.00-1.05 m

**1460 ± 110**  
 **$\delta^{13}\text{C} = -27.8\%$**

<b>Hel-3651</b>	<b>2400 ± 100</b>
Peat, depth 1.745-1.795 m	$\delta^{13}\text{C} = -26.5\%$
<b>Hel-3652</b>	<b>3460 ± 100</b>
Peat, depth 2.417-2.467 m	$\delta^{13}\text{C} = -27.2\%$
<b>Hel-3653</b>	<b>3410 ± 90</b>
Peat, depth 2.467-2.517 m	$\delta^{13}\text{C} = -28.3\%$
<b>Hel-3654</b>	<b>4350 ± 100</b>
Peat, depth 2.517-2.617 m (= bottom)	$\delta^{13}\text{C} = -28.8\%$

**3L25 (II)**

<b>Hela-33</b>	<b>1530 ± 55</b>
Peat, depth 1.00-1.05 m	$\delta^{13}\text{C} = -28.1\%$
<b>Hel-3656</b>	<b>2310 ± 100</b>
Peat, depth 1.745-1.795 m	$\delta^{13}\text{C} = -28.4\%$
<b>Hel-3657</b>	<b>3480 ± 100</b>
Peat, depth 2.450-2.50 m	$\delta^{13}\text{C} = -27.8\%$
<b>Hel-3658</b>	<b>3580 ± 100</b>
Peat, depth 2.50-2.55 m	$\delta^{13}\text{C} = -26.8\%$
<b>Hel-3659</b>	<b>4340 ± 100</b>
Peat, depth 2.55-2.625 m (= bottom)	$\delta^{13}\text{C} = -28.5\%$

**JOKINIEMI SERIES, VANTAA**

60°17'N, 25°02'E; 23-25 m a.s.l.

Coll. 1993 and 1994 and subm. 1995 by K. Katiskoski.

General comment (KK): These samples were collected during the excavation in 1994 at the large dwelling site complex of Jokiniemi-Stenkulla-Maarinkunnas on the western bank of the river Keravanjoki in Vantaa. The complex is mainly dated to the Typical and Late Combed Ware stage (Ka II-III:1) of the Neolithic. Sample Hel-3634 (5040 ± 80 BP) is from a hearth with sherds of Corded Ware as well, but is to be connected with Combed Ware. Hela-31 (880 ± 50 BP) is from the cultural layer below the present field representing late prehistoric/early medieval activities. The third sample is from *Corylus avellana* nutshells and is in accordance with the archaeological dating of the site (Hela-32: 4885 ± 60 BP). The relation of dating between charcoal on one hand and nutshells on the other hand is equal with a few datings of charcoal and charred crust from ceramics on the eastern bank of the river, i.e. charcoal gives older dates than nutshells or charred crust etc. The datings also refer to later activities at the site (cf. Hel-2470 and Hel-2471: 760 ± 90 and 560 ± 120 BP in Jungner and Sonninen 1996).

Ref. In Edgner et al., eds. (1996).

<b>Hel-3634</b>	<b>Sample</b>	<b>5040 ± 80</b>
	Charcoal, depth 0.25 m	$\delta^{13}\text{C} = -25.3\%$
<b>Hel-31</b>	<b>Juniper berry 94:1</b>	<b>880 ± 50</b>
	Charred, depth 0.35 m	$\delta^{13}\text{C} = -25.9\%$
<b>Hel-32</b>	<b>KM 28382</b>	<b>4885 ± 60</b>
	Charred nutshell ( <i>Corylus avellana</i> ), depth 0.40 m	$\delta^{13}\text{C} = -25.3\%$

**Hel-3635 – Hel-3637** See LAKKASUO SERIES Hel-3633

### TAHIRBAJ SERIES, TURKMENISTAN

Coll. and subm. 1993 by M Cattani

<b>Hel-3638</b>	<b>THR-1 A1 19</b>	<b>2080 ± 110</b>
	Charcoal	$\delta^{13}\text{C} = -12.2\%$
<b>Hel-3639</b>	<b>THR-1 A3 36</b>	<b>2560 ± 110</b>
	Charcoal	$\delta^{13}\text{C} = -10.7\%$
<b>Hel-3641</b>	<b>THR-1 A3 141</b>	<b>2560 ± 90</b>
	Charcoal	$\delta^{13}\text{C} = -20.5\%$

### VÄLIKANGAS SERIES, KAAKKURI, OULU 22

64°57'N, 25°32'E; 16.5 m a.s.l.

Coll. 1988 by M. Mäki vuoti and subm. 1995 by M. Mäki vuoti and C. Carpelan (Early in the North Project).

General comment (MM): The charcoal samples are from burials in cairn No. 2: Hel-3640 from burial No. 2 (cremation) and Hel-3642 from burial No. 7 (cremation). The radiocarbon dates are in conflict with the archaeological dating. The artifacts from the burials date to the Roman Iron Age.

<b>Hel-3640</b>	<b>KM 24597:46</b>	<b>660 ± 90</b>
	Charcoal, depth 0.45 m	$\delta^{13}\text{C} = -24.7\%$
<b>Hel-3642</b>	<b>KM 24597:48</b>	<b>150 ± 70</b>
	Charcoal, depth 0.50 m	$\delta^{13}\text{C} = -25.7\%$

**Hel-3641** See TAHIRBAJ SERIES Hel-3638

**Hel-3642** See VÄLIKANGAS SERIES Hel-3640



**Hel-3643** See IFJORD SERIES Hel-3616

**Hel-3644** See HOPSEIDET SERIES Hel-3539

**Hel-3645 – Hel-3654** See LAKKASUO SERIES Hel-3633

**Hel-3655 KULTISALMI, RANUA 37**

**5360 ± 90**  
**δ<sup>13</sup>C = -25.3‰**

66°05'N, 27°07'E; 177 m a.s.l.

Coll. 1991 by K. Katiskoski and subm 1995 by K. Katiskoski and C. Carpelan (Early in the North Project).

Sample 7, KM 25927, charcoal, depth 0.30 m

Comment (KK): The sample is a part of a series of seven samples, six of which have been dated earlier – see Kultisalmi Series in Jungner and Sonninen (1998); also In: Edgren et al., eds. (1995). They represent an extended chronology of the large dwelling site of Kultisalmi by the lake Simojärvi in Ranua, Northern Ostrobothnia. The earlier samples are dated to the Mesolithic (Hel-3182: 7320 ± 140 BP), the Early Metal Age (Hel-3081: 2600 ± 80 BP) and the Iron Age (Hel-3082-Hel-3084: 1760 ± 100; 1570 ± 90; 1650 ± 100 and Hel-3183: 1090 ± 110 BP). The sample at hand was collected from a hearth in the western part of the site with sherds of Early Neolithic Sär 1 pottery. The dating (5360 ± 90 BP) seems rather late compared with the dating of that pottery. There is, however, even typical Combed Ware Style 2 further east at the site. The sampled hearth was located in a lower stratum compared with an adjoining hearth-pit visible on the ground with the youngest date of the site.

**Hel-3656 – Hel-3659** See LAKKASUO SERIES Hel-3633

## **IILOMPOLO SERIES, IIJÄRVI**

Coll. and subm. 1995 by H. Hyvärinen.

General comment (HH): The dates indicate a slow rate of sedimentation from early to mid-Holocene times (from ca. 8000 to 4000 BP), and an accelerated rate during the last 4000 years. This trend, observed in several lake sediment cores from Lapland, is assumed to reflect a late Holocene rise in lake-level stands in Lapland, hence an increase in the climatic humidity.

Ref. Hyvärinen and Alhonen (1994), Mäkelä (1998), Eronen et al. (1999).

**Hel-3660 Sample 1**  
Gyttja, depth 0.20-0.25 m

**1070 ± 100**  
**δ<sup>13</sup>C = -24.1‰**

**Hel-3661 Sample 2**  
Gyttja, depth 0.50-0.55 m

**1980 ± 90**  
**δ<sup>13</sup>C = -24.2‰**

**Hel-3662 Sample 3**  
Gyttja, depth 0.80-0.85 m

**2690 ± 90**  
**δ<sup>13</sup>C = -24.6‰**

<b>Hel-3663 Sample 4</b>	<b>3450 ± 90</b>
Gyttja, depth 1.10-1.15 m	$\delta^{13}\text{C} = -24.1\%$
<b>Hel-3664 Sample 5</b>	<b>4900 ± 110</b>
Gyttja, depth 1.40-1.45 m	$\delta^{13}\text{C} = -24.5\%$
<b>Hel-3665 Sample 6</b>	<b>7890 ± 110</b>
Gyttja, depth 1.65-1.70 m	$\delta^{13}\text{C} = -24.3\%$

### TERVANIEMI SERIES, TAIVALKOSKI 37

65°34'N, 29°00'E; 239-240 m a.s.l.

Coll. 1993 and 1994 and subm. 1995 by E. Raike and J. Saukkonen.

Ref. In Edgren et al., eds. (1996).

<b>Hel-3666 Sample 1994/1</b>	<b>6250 ± 100</b>
Charcoal, depth 0.20 m	$\delta^{13}\text{C} = -26.3\%$
<b>Hel-3669 Sample 3</b>	<b>7140 ± 110</b>
KM 28128:1375, charcoal, depth 0.30 m	$\delta^{13}\text{C} = -25.0\%$
<b>Hel-3670 Sample 6</b>	<b>2750 ± 80</b>
KM 28128:1375, charcoal, depth 0.40 m	$\delta^{13}\text{C} = -25.5\%$
<b>Hela-27</b>	<b>6015 ± 170</b>
Chewing resin, depth 0.10 m	$\delta^{13}\text{C} = -26.0\%$

**Hel-3667 – Hel-3668** See POIKAMELLA SERIES Hel-3645

**Hel-3669 – Hel-3670** See TERVANIEMI SERIES Hel-3666

### KITULANSUO SERIES, RISTIINA

61°30'N, 27°22'E; 82 m a.s.l.

Coll. 1994-1995 and subm. 1995-1996 by M. Lavento.

Ref. In Edgren et al., eds. (1998).

<b>Hel-3671 Sample No. 1</b>	<b>550 ± 90</b>
Charcoal, depth 0.30 m	$\delta^{13}\text{C} = -26.1\%$
<b>Hel-3672 Sample No. 2</b>	<b>530 ± 80</b>
Charcoal, depth 0.30 m	$\delta^{13}\text{C} = -25.6\%$
Comment (ML): The purpose of both samples Hel-3671 and Hel-3672 was to date the fireplaces found at an Early Metal Age dwelling site. A great majority of the ceramics found during the excavation was of the Sarsa-Tomitsa Ware while a small number of ceramics belongs to the	

Luukonsaari Ware. According to the finds, the C-14 dates should fall between 3500-1500 BP. Because the results show unexpectedly recent dates, it is possible that later fires (possibly natural forest fires) have occurred at the site. At the excavation some traces of lighthouse structures dating to the Historical Period were located, which might explain the datings.

**Hel-3836 Sample No. 15** **2170 ± 90**  
 Charcoal, depth 0.30 m  $\delta^{13}\text{C} = -24.6\%$   
 Comment (ML): Metal Age dwelling site. The find context around the hearth was Sarsa-Tomitsa Ware. Compared with the AMS-date (Hela-104) of Sarsa-Tomitsa Ware at the site, this date is very late.

**Hel-3837 Sample No. 23** **1530 ± 80**  
 Charcoal, depth 0.30 m.  $\delta^{13}\text{C} = -26.4\%$   
 Comment (ML): The sample was taken from an iron smelting furnace of Eastern type. The context seems clean and some sherds of Luukonsaari ceramics were collected from the furnace during the excavation. The sample is very large and also TL-samples have been taken.

**Hela-104 KM 28960:586** **3220 ± 65**  
 Charcoal  $\delta^{13}\text{C} = -30.2\%$   
 Comment (ML): Charred crust from the surface of a sherd of Sarsa-Tomitsa Ware. The purpose of dating was to get more exact dates for the use of Sarsa-Tomitsa Ware in Finland. The date refers to the beginning of the period.

## TÖÖLÖNLAHTI SERIES, HELSINKI

60°11'N, 24°57'E; 0.30-0.60 m a.s.l.

Coll. and subm. 1995 by M. Tikkanen.

General comment (MT): The dates are not in correspondence to the sedimentation stratigraphy due to the contamination of the upper samples with older sediments washed off the slopes in the course of land uplift and field clearance.

Ref. Tikkanen et al. (1996).

**Hel-3673 Sample 1** **1780 ± 80**  
 Clay+gyttja, depth 1.45-1.55 m  $\delta^{13}\text{C} = -23.5\%$

**Hel-3674 Sample 2** **1950 ± 100**  
 Clay+gyttja, depth 2.45-2.55 m  $\delta^{13}\text{C} = -19.6\%$

**Hel-3675 Sample 3** **1650 ± 100**  
 Clay+gyttja, depth 3.40-3.55 m  $\delta^{13}\text{C} = -22.3\%$

**SODANKYLÄ SERIES, SODANKYLÄ**

Coll. 1994 and subm. 1995 by K. Katiskoski.

General comment (KK): These samples were collected from two site excavations due to the planned construction of the Kelukoski hydro power-station on the river Kitinen, just N of the village of Sodankylä in Lapland. The samples from the small dwelling site of Kelukoski E by the rapids of Kitinen were collected from the cultural layer. The first sample (Hel-3676: 4610 ± 100 BP) comes from excavation area 3 with mainly finds of quarts, quartzite and slate and a single rimsherd of Sär 2 asbestos ware. The Neolithic date of the sample was older than expected as compared with the Early Metal Age pottery and may represent an older occupation of the site. The other sample (Hel-3677: 4470 ± 80 BP) from a trial-pit with lithic finds and burnt bones refers to the same Neolithic occupation horizon. Taking into consideration the dates of the samples, the single sherd of Sär 2 Ware and the location of the site as well it seems probable that the site has been in frequent use during the Neolithic and the Early Metal Age, at least.

The site of the third sample (Hel-3678: 2510 ± 80 BP), Neulaniemi (Neulanniemi), is a small camp with a number of pits (pitfalls?) on an ancient riverbank? close to the confluence of the tributary river Sattasjoki with the river Kitinen, 11 km NNE of the village of Sodankylä. The sample was taken from the bottom layer of a pit 2 by 3 m across, already covered with sand in ancient times. The finds consist of quartz with tools (scrapers, knives and arrowheads). No pottery was found. Burnt bone of beaver, elk and deer was extensive. An older dating of the sample was expected even though there is no direct conflict with the finds of the site.

Ref. In Edgren et al., eds. (1996).

**Hel-3676 Sample 1/Kelukoski** **4610 ± 100**  
 67°27'N, 26°31'E; 181 m a.s.l. **δ<sup>13</sup>C = -25.4‰**  
 Charcoal, depth 0.25 m

**Hel-3677 Sample 2/Kelukoski** **4470 ± 80**  
 67°27'N, 26°31'E; 182 m a.s.l. **δ<sup>13</sup>C = -25.2‰**  
 Charcoal, 0.35-0.50 m

**Hel-3678 Sample 3/Neulaniemi** **2510 ± 80**  
 67°31'N, 26°37'E; 180 m a.s.l. **δ<sup>13</sup>C = -25.2‰**  
 Charcoal, depth 0.10-0.15 m

**KOTIJÄNKÄ SERIES, ROVANIEMI 469**

66°28'N, 25°56'E; 84.70 m a.s.l.

Coll. 1991 and 1994 by H. Kotivuori and subm. 1994 and 1995 by H. Kotivuori and C. Carpelan (Early in the North Project).

General comment: See Sierijärvi 469 Series in Jungner and Sonninen (1998); also Kotivuori (1996). See Charred Crust Series (Hela-35 this volume).

**Hel-3679 469 Sample 3** **2070 ± 90**  
 Charcoal, depth 0.15 m **δ<sup>13</sup>C = -25.1‰**

<b>Hel-3688</b> 469 Sample 4 Charcoal, depth 0.15 m	1950 ± 80 $\delta^{13}\text{C} = -25.9\text{‰}$
<b>Hel-3689</b> 469 Sample 6 Charcoal, depth 0.10-0.15 m	2230 ± 80 $\delta^{13}\text{C} = -25.3\text{‰}$
<b>Hela-14</b> KM 26780:81 Charred crust from ceramics, depth 0.10-0.20 m	2410 ± 75 $\delta^{13}\text{C} = -26.7\text{‰}$
<b>Hela-15</b> KM 26780:88 Charred crust from ceramics, depth 0.10-0.20 m	2465 ± 75 $\delta^{13}\text{C} = -26.8\text{‰}$
<b>Hela-16</b> KM 26780:255 Charred crust from ceramics, depth 0.10-0.20 m	2540 ± 80 $\delta^{13}\text{C} = -27.3\text{‰}$

### KRASNOYARSK SERIES, RUSSIA

Coll. By F.Z. Glebov and subm. 1995 by H. Vasander.

#### Fomka Series

60°21'N, 90°31'E

<b>Hel-3680</b> Fomka-1 Peat, depth 2.40-2.50 m	2290 ± 100 $\delta^{13}\text{C} = -27.2\text{‰}$
<b>Hel-3681</b> Fomka-2 Peat, depth 1.40-1.50 m	2620 ± 80 $\delta^{13}\text{C} = -28.3\text{‰}$
<b>Hel-3685</b> Fomka-3 Peat, depth 3.40-3.50 m	3030 ± 100 $\delta^{13}\text{C} = -25.5\text{‰}$
<b>Hel-3686</b> Fomka-4 Peat, depth 4.90-5.00 m	5980 ± 80 $\delta^{13}\text{C} = -28.6\text{‰}$
<b>Hel-3687</b> Fomka-5 Peat, depth 5.90-6.00 m	7150 ± 120 $\delta^{13}\text{C} = -28.4\text{‰}$
<b>Hel-3696</b> Fomka-6 Peat, depth 1.90-2.00 m	3860 ± 110 $\delta^{13}\text{C} = -28.6\text{‰}$
<b>Hel-3697</b> Fomka-7 Peat, depth 2.90-3.00 m	2820 ± 110 $\delta^{13}\text{C} = -26.9\text{‰}$
<b>Hel-3698</b> Fomka-8 Peat, depth 3.90-4.00 m	3920 ± 120 $\delta^{13}\text{C} = -25.7\text{‰}$
<b>Hel-3699</b> Fomka-9 Peat, depth 5.40-5.50 m	5800 ± 110 $\delta^{13}\text{C} = -28.0\text{‰}$

<b>Hel-64 Fomka-10</b> Peat, depth 6.30-6.40 m	<b>6815 ± 105</b> $\delta^{13}\text{C} = -24.6\text{‰}$
<b>Hel-3736 River Khantayka c.Fomka</b> 68°27'N, 89°05'E Peat, depth 3.10-3.30 m	<b>4950 ± 100</b> $\delta^{13}\text{C} = -27.7\text{‰}$
<b>Hel-3737 River Khantayka c Region</b> 68°27'N, 89°05'E Peat, depth 3.30-3.50 m	<b>430 ± 80</b> $\delta^{13}\text{C} = -27.6\text{‰}$

### Kangatovo Series

63°41'N, 87°51'E

<b>Hel-3721 Kangatovo-1</b> Peat, depth 3.90-4.00 m	<b>7870 ± 180</b> $\delta^{13}\text{C} = -29.4\text{‰}$
<b>Hel-3722 Kangatovo-2</b> Peat, depth 3.60-3.70 m	<b>6100 ± 110</b> $\delta^{13}\text{C} = -29.2\text{‰}$
<b>Hel-3723 Kangatovo-3</b> Peat, depth 3.20-3.30 m	<b>3700 ± 110</b> $\delta^{13}\text{C} = -29.4\text{‰}$
<b>Hel-3724 Kangatovo-4</b> Peat, depth 2.80-2.90 m	<b>3210 ± 100</b> $\delta^{13}\text{C} = -26.4\text{‰}$
<b>Hel-3725 Kangatovo-5</b> Peat, depth 2.40-2.50 m	<b>2780 ± 100</b> $\delta^{13}\text{C} = -26.7\text{‰}$
<b>Hel-3726 Kangatovo-6</b> Peat, depth 2.00-2.10 m	<b>2610 ± 100</b> $\delta^{13}\text{C} = -26.8\text{‰}$
<b>Hel-3727 Kangatovo-7</b> Peat, depth 1.60-1.70 m	<b>2170 ± 120</b> $\delta^{13}\text{C} = -26.5\text{‰}$
<b>Hel-3728 Kangatovo-8</b> Peat, depth 1.20-1.30 m	<b>1360 ± 100</b> $\delta^{13}\text{C} = -27.5\text{‰}$
<b>Hel-3729 Kangatovo-9</b> Peat, depth 3.80-3.90 m	<b>7280 ± 130</b> $\delta^{13}\text{C} = -28.7\text{‰}$
<b>Hel-3730 Kangatovo-10</b> Peat, depth 3.40-3.50 m	<b>4160 ± 100</b> $\delta^{13}\text{C} = -29.0\text{‰}$
<b>Hel-3731 Kangatovo-11</b> Peat, depth 3.00-3.10 m	<b>3280 ± 100</b> $\delta^{13}\text{C} = -29.0\text{‰}$
<b>Hel-3732 Kangatovo-12</b> Peat, depth 2.60-2.70 m	<b>2770 ± 100</b> $\delta^{13}\text{C} = -26.6\text{‰}$

<b>Hel-3733 Kangatovo-13</b>	<b>2770 ± 110</b>
Peat, depth 2.20-2.30 m	$\delta^{13}\text{C} = -26.9\%$
<b>Hel-3734 Kangatovo-14</b>	<b>2010 ± 100</b>
Peat, depth 1.80-1.90 m	$\delta^{13}\text{C} = -26.7\%$
<b>Hel-3735 Kangatovo-15</b>	<b>1440 ± 100</b>
Peat, depth 1.40-1.50 m	$\delta^{13}\text{C} = -27.2\%$

### KIIANMAA SERIES, KEMINMAA 23

65°43'N, 24°45'E; 33.35 m a.s.l.

Coll. 1993 by J. Okkonen and subm. 1995 by J. Okkonen and C. Carpelan (Early in the North Project).

General comment: See Hel-3236 in Jungner and Sonninen (1998). See also Charred Crust Series (Hela-35 this volume)

Ref. In Edgren et al., eds. (1996).

<b>Hel-3682 KM 27700:4</b>	<b>2370 ± 80</b>
Charcoal, depth 0.18 m	$\delta^{13}\text{C} = -25.2\%$
Comment (JO): Charcoal from a small soot pit located close to a cooking pit. An Iron Age date was accepted.	
<b>Hela-50 KM 28368:21</b>	<b>2695 ± 115</b>
Subm. 1995 by C. Carpelan	$\delta^{13}\text{C} = -19.3\%$
Charred crust from ceramics	
Comment (JO): Sär 2 Ware from the same context.	

### KUUSELANKANGAS SERIES I, YLI-II

65°21'N, 25°55'E; 60 m a.s.l.

Coll. 1994 by M. Makkonen and subm. 1995 by P. Koivunen and C. Carpelan (Early in the North Project).

General comment (MT): The results are in accordance with the archaeological results: the Late Stone Age (Kierikki Ware period). – See Kuuselankangas Series II (Hela-74 this volume). See also Charred Crust Series (Hela-35 this volume).

<b>Hel-3683 Sample 1, 3B</b>	<b>4440 ± 110</b>
Charcoal	$\delta^{13}\text{C} = -25.3\%$
<b>Hel-3684 Sample 2, 5A</b>	<b>4590 ± 120</b>
Charcoal	$\delta^{13}\text{C} = -25.7\%$
<b>Hela-51 Sample II, KKK-94</b>	<b>4800 ± 115</b>
Charred crust from ceramics	$\delta^{13}\text{C} = -23.4\%$
<b>Hela-52 Sample III/152/30/8</b>	<b>4420 ± 90</b>
Charred crust from ceramics	$\delta^{13}\text{C} = -23.2\%$

**Hel-3685 – Hel-3687** See KRASNOYARSK SERIES (Fomka) Hel-3680

**Hel-3688 – Hel-3689** See KOTIJÄNKÄ SERIES Hel-3679

#### RIITAKANRANTA SERIES, ROVANIEMI 474

66°27'N, 25°59'E; 90 m a.s.l.

Coll. 1990 and 1991 by H. Kotivuori and subm. 1995 by H. Kotivuori and C. Carpelan (Early in the North Project).

General comment: See Sierijärvi 474 A Series in Jungner and Sonninen (1998); see also Kotivuori (1996).

<b>Hel-3690</b>	<b>474a Sample 7</b>	<b>2080 ± 100</b>
	Charcoal, depth 0.10-0.15 m	$\delta^{13}\text{C} = -25.7\%$

<b>Hel-3691</b>	<b>474a Sample 8</b>	<b>1650 ± 110</b>
	Charcoal, depth 0.15 m	$\delta^{13}\text{C} = -25.9\%$

#### ISO LEHMÄLAMPPI 1 SERIES, VIHTI

60°21'N, 24°26'E; 91.70 m a.s.l.

Coll. and subm. 1995 by K. Sarmaja-Korjonen.

General comment (K S-K): There were two layers of aquatic mosses in the lower section of the core. The core was collected from the deepest part of the lake where the depth of water was 8.1 m. This series dates the lower and upper boundaries of the moss layers. The ages are well in accordance with the pollen chronology and forest development in southern Finland.

Ref. Sarmaja-Korjonen (1998), Sarmaja-Korjonen and Alhonen (1999).

<b>Hel-3692</b>	<b>IL 1</b>	<b>8100 ± 120</b>
	Gyttja, depth 2.11-2.18 m	$\delta^{13}\text{C} = -28.6\%$

<b>Hel-3693</b>	<b>IL 2</b>	<b>7930 ± 90</b>
	Gyttja, depth 1.90-1.97 m	$\delta^{13}\text{C} = -29.3\%$

<b>Hel-3694</b>	<b>IL 3</b>	<b>7300 ± 120</b>
	Gyttja, depth 1.68-1.75 m	$\delta^{13}\text{C} = -31.2\%$

<b>Hel-3695</b>	<b>IL 4</b>	<b>7260 ± 140</b>
	Gyttja, depth 1.55-1.62 m	$\delta^{13}\text{C} = -32.1\%$

**Hel-3696 – Hel-3699** See KRASNOYARSK SERIES (Fomka) Hel-3680

**Hel-3700 – Hel-3708** See SUOSILMU PROJECT (Separate samples) Hel-3608



**VEHKO SERIES, KOTKA**

60°38'N, 26°47'E; 35 m a.s.l.

Coll. 1993 by K. Tolonen and K. Weckström, subm. 1995 by K. Weckström.

Ref. Weckström (1996).

Comment (KW): The samples Hel-3715 and Hel-3718 are younger than expected, suggesting a very high accumulation rate of ~0.5/1.3 cm/year. One reason for this could be the transportation of present carbon via roots of, for example, *Ericaceae*, which were abundant at the site.

<b>Hel-3709</b>	<b>Vehko I</b>	<b>3640 ± 100</b>
	Peat, depth 2.41-2.44 m	$\delta^{13}\text{C} = -29.8\%$
<b>Hel-3710</b>	<b>Vehko II</b>	<b>980 ± 90</b>
	Peat, depth 1.45-1.49 m	$\delta^{13}\text{C} = -27.2\%$
<b>Hel-3715</b>	<b>Vehko III</b>	<b>220 ± 90</b>
	Peat, depth 0.95-1.00 m	$\delta^{13}\text{C} = -25.8\%$
<b>Hel-3718</b>	<b>Vehko IV</b>	<b>40 ± 90</b>
	Peat, depth 0.50-0.55 m	$\delta^{13}\text{C} = -24.9\%$

**BACTRIA SERIES, UZBEKISTAN**

Subm. by F. Hiebert.

<b>Hel-3711</b>	<b>Sample 1, Djarkutan Citadel</b>	<b>3690 ± 90</b>
	Charcoal	$\delta^{13}\text{C} = -25.9\%$
<b>Hel-3712</b>	<b>Sample 2, Djarkutan Klom</b>	<b>3450 ± 80</b>
	Charcoal	$\delta^{13}\text{C} = -23.6\%$
<b>Hel-3713</b>	<b>Sample 3, Djarkutan Citadel</b>	<b>3710 ± 90</b>
	Charcoal	$\delta^{13}\text{C} = -23.5\%$
<b>Hel-3714</b>	<b>Sample 4, Djarkutan Citadel</b>	<b>3670 ± 120</b>
	Charcoal	$\delta^{13}\text{C} = -24.0\%$
<b>Hel-3716</b>	<b>Sample 5, Sapalli depe</b>	<b>3590 ± 90</b>
	Charcoal	$\delta^{13}\text{C} = -25.1\%$
<b>Hel-3717</b>	<b>Sample 6, Talashkan depe</b>	<b>2330 ± 80</b>
	Charcoal	$\delta^{13}\text{C} = -25.3\%$

**Hel-3715** See VEHKO SERIES Hel-3709

**Hel-3716 – Hel-3717** See BACTRIA SERIES Hel-3711

**Hel-3718** See VEKHO SERIES Hel-3709

### **RUOKOLAMMINSUO SERIES, VIROLAHTI**

60°36'N, 27°30'E; 20 m a.s.l.

Coll. and subm. 1995 by A. Miettinen and H. Hyvärinen.

Ref. Miettinen (2002).

<b>Hel-3719 Ruo 1</b>	<b>5700 ± 110</b>
Gyttja, depth 1.67-1.74 m	$\delta^{13}\text{C} = -25.8\text{‰}$
<b>Hel-3720 Ruo 2</b>	<b>7520 ± 110</b>
Gyttja, depth 1.92-1.98 m	$\delta^{13}\text{C} = -26.1\text{‰}$
<b>Hela-61 Ruo 3</b>	<b>5035 ± 115</b>
Water plant, depth 1.77 m	$\delta^{13}\text{C} = -27.6\text{‰}$
<b>Hela-62 Ruo 4</b>	<b>4425 ± 100</b>
Wood, depth 1.57 m	$\delta^{13}\text{C} = -28.7\text{‰}$

**Hel-3721 – Hel-3735** See KRASNOYARSK SERIES (Kangatovo) Hel-3680

**Hel-3736 – Hel-3737** See KRASNOYARSK SERIES (Fomka) Hel-3680

**Hel-3738 SIRKKA 3, SIRKKAJÄRVI** **9310 ± 160**  
 $\delta^{13}\text{C} = -24.5\text{‰}$

60°51'N, 25°25'E; 131.90 m a.s.l.

Coll. and subm. 1995 by A. Korhola and M. Tikkanen.

Clay and gyttja, depth 8.82-8.85 m

**Hel-3739 – Hel-3746** See SUOSILMU PROJECT (Lakkasuo) Hel-3608

### **IRON PRODUCTION SITE SERIES**

Coll. and subm 1995 (Hel-3747 – Hel-3778) and 1996 (Hel-3872 – Hel-3875) by E. Suominen.

General comment (ES): Charcoal from heaps of charcoal at iron production sites.

<b>Hel-3747 Rempsunsuo, Hyrynsalmi</b>	<b>340 ± 90</b>
64°33'N, 28°49'E; 205 m a.s.l.	$\delta^{13}\text{C} = -25.2\text{‰}$
Charcoal, depth 0.05-0.15 m	

<b>Hel-3748 Likosuo, Hyrynsalmi</b>	<b>90 ± 70</b>
64°45'N, 28°23'E; 166 m a.s.l.	$\delta^{13}\text{C} = -26.3\%$
Charcoal, depth 0.05-0.15 m	
<b>Hel-3777 Multipuro, Hyrynsalmi</b>	<b>90 ± 90</b>
64°44'N, 28°21'E; 186 m a.s.l.	$\delta^{13}\text{C} = -26.1\%$
Charcoal, depth 0.05-0.10 m	
Comment (ES): According to local tradition this iron production site dates to the end of the 18th or beginning of the 19th century.	
<b>Hel-3778 Autioniemi E, Kuhmo</b>	<b>160 ± 70</b>
64°04'N, 29°10'E; 165 m a.s.l.	$\delta^{13}\text{C} = -26.7\%$
Charcoal, depth 0.02-0.10 m	
<b>Hel-3872 Rautaruukinaho, Suomussalmi</b>	<b>380 ± 90</b>
64°41'N, 29°15'E; 237 m a.s.l.	$\delta^{13}\text{C} = -25.9\%$
Charcoal, depth 0.02-0.10 m	
<b>Hel-3873 Naamankajärvi SE, Suomussalmi</b>	<b>340 ± 80</b>
65°04'N, 28°17'E; 185 m a.s.l.	$\delta^{13}\text{C} = -25.9\%$
Charcoal, depth 0.05-0.10 m	
<b>Hel-3874 Akkosuo, Hyrynsalmi</b>	<b>350 ± 90</b>
64°35'N, 28°59'E; 190 m a.s.l.	$\delta^{13}\text{C} = -26.3\%$
Charcoal, depth 0.05-0.10 m	
<b>Hel-3875 Honkamäki, Hyrynsalmi</b>	<b>300 ± 80</b>
64°35'N, 28°46'E; 215 m a.s.l.	$\delta^{13}\text{C} = -25.3\%$
Charcoal, depth 0.05-0.15 m	
<b>Hel-3951 Hyttisuo, Hyrynsalmi</b>	<b>120 ± 80</b>
64°44'N, 28°14'E; 202 m a.s.l.	$\delta^{13}\text{C} = -24.3\%$
Coll. 1991 and subm. 1996 by E. Suominen.	
Comment (ES): Charred wood from outer structure of a shaft furnace at an iron production site, depth 0.70 m.	

**Hel-3749 – Hel-3764** See SUOSILMU PROJECT (Separate samples) Hel-3608

**Hel-3765 – Hel-3769** See WESTERN DESERT SERIES Hel-3607

**Hel-3770 – Hel-3776** See SUOSILMI PROJECT (Separate samples) Hel-3608

**Hel-3777 – Hel-3778** See IRON PRODUCTION SITE SERIES Hel-3747

